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The Journal of  
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# The Journal of Laryngology and Otology

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# The Journal of Laryngology and Otology

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## PRESENT STATUS OF RADIUM IN LARYNGEAL AND OESOPHAGEAL CANCER IN THE UNITED STATES.

By HENRY HALL FORBES, M.D., F.A.C.S. (New York City).

IN this paper, the writer will attempt to present a short résumé of the work of a few of the radiologists in America, and the conclusions which they have been able to draw from their experience in the use of radium, as well as his own results in the treatment of cancer of the larynx and oesophagus.

**The Larynx.**—In April 1921, Dr T. J. Harris<sup>1</sup> was able to collect from American literature only eleven cases of cancer of the larynx that were reported as cured from the use of radium treatment alone, and of these only three had lived more than five years without recurrence. From his study of the work done up to the time of his report, Dr Harris came to the conclusion that there is not sufficient reason for the substitution of radium where surgery is indicated, but in inoperable cases the use of radium is certainly warranted; radium also is useful as a pre-operative and post-operative measure because it is able to stop mitosis of the cells before any possible stimulation can be set up by surgery.

In the discussion on Dr Harris's paper, Dr Quick stated that over 100 cases of laryngeal cancer had been treated by radium at the Memorial Hospital, New York City. While he was of the opinion that many of them would have been better not treated, several of the cases were apparently free from disease,—the longest period without recurrence being three years, others from less than a year to a year and a half or more.. Dr Quick expressed the opinion that as

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methods of radium treatment are improved, radium can claim a recognised position in the treatment of cases in which operation is doubtful. If operation is decided on, he considers pre-operative radiation as absolutely indicated, the post-operative use of radium of more doubtful value. As to methods, Dr Quick uses external radiation in every case, and in intrinsic cancer direct application by means of a specially constructed funnel-like apparatus representing a very small bulk of radium emanations, 500 to 600 mg., in a steel protecting cone and on a long wire for further protection; by bending the wire it reaches the lesion and a heavy dose can be given in a few minutes, and the opposite side does not get sufficient radiation to cause a stenosis. If buried emanations are employed 1 millicurie tubes or less are used, about one tube per each c.c. of tissue, and they are left in place until used up, giving a total dosage of about 132 millicurie hours.

Dr Lewis of Philadelphia reported in 1921, that he had treated sixteen cases of cancer of the larynx with radium. In the first four, the radium capsule properly screened was introduced into the larynx. But in the later cases 12.5 mg. radium needles, to which strings were securely tied, were introduced into the growth and left in position in some instances for seven to twelve hours; the number of needles depends upon the size of the growth. In addition, external applications were also used. Of four cases which were operated upon by laryngectomy or thyrotomy in addition to radium treatment, two have died, one showed improvement after a recent laryngectomy, and one patient showed no evidence of recurrence in four months. Of the other twelve cases, which were considered inoperable and were tracheotomised and treated vigorously with radium, all but one had died, and it was failing rapidly at the time of the report. The author is convinced that radium alone is indicated only in inoperable cases of cancer of the larynx, where its analgesic effects are of benefit. In operable cases, surgery is indicated along with radium both for pre-operative and post-operative treatment.<sup>2</sup>

Dr Field, of the Radium Institute of New York, states that the application of radium tubes to a tumour mass within the larynx by suspension laryngoscopy has been employed nearly fifty times at the Institute, with some good results, but that the use of radium needles has been found to be preferable.

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The radium needles are plunged into the tumour mass with a long-armed alligator forceps worked through the direct laryngoscope; 7.5 mgs. buried in each cubic centimetre of tissue for three to five hours has been found effective. This should be supplemented by a sharp "cross-fire" through the neck of 300 mgs. for seven hours.<sup>3</sup>

In the discussion on Dr Harris's paper, Dr Field stated that twenty-eight cases of laryngeal cancer had been treated with the radium needles at the Institute; while the time was too short to claim cures, nine of these cases had remained well and without recurrence for over a year. These results he felt were "very encouraging."

Dr Freer of Chicago has devised an apparatus for the direct application to malignant growths of the upper air passages of radium emanations in small enamelled silver tubules. For laryngeal use the containers or "screens" with the radium emanation tubes are attached to tubular applicators, also designed by Dr Freer. If 50 millicuries are employed, the duration of treatment for laryngeal cancer should not be less than one hour; for 100 millicuries, one half-hour; for 200 millicuries, one-quarter of an hour. A complete series of treatments is 400 millicurie hours in weekly treatments. After an interval of six weeks or two months, the series may be repeated. Freer has found one series sufficient to cause an ordinary-sized cancer of the larynx to disappear in about two weeks after the last raying; he has not, however, tried this treatment in very extensive carcinoma. The reaction usually is not severe, but it varies in degree in different cases, and may occasionally cause considerable discomfort. Although the treatment has been used too recently to determine end results, Freer has found that it arrests laryngeal carcinoma, and he considers that laryngectomy or laryngotomy is not indicated until radium emanations have been tried. If surgery proves necessary the radium treatment is the best possible pre-operative measure. If the submaxillary or cervical lymphatic glands are involved, heavy external all-night rayings are indicated up to 800 millicuries.<sup>4</sup>

F. E. Simpson of Chicago in his recent (1922) work on radium, states that he considers Freer's method the best for the radium treatment of cancer of the larynx.<sup>5</sup>

**The Œsophagus.**—In 1917, Janeway reported twenty-two cases of cancer of the œsophagus treated by radium; only one

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of these showed apparently complete retrogression; five others were definitely improved, and fifteen unimproved.<sup>6</sup>

In the treatment of cancer of the œsophagus after careful localisation of the growth, Dr F. E. Simpson of Chicago passes a bougie containing the radium emanation into the strictured part of the œsophagus, where it is maintained in position for about eight hours; 100 to 150 mc. of radium emanation may be used, screened with 1.5 mm. of silver. In some cases, a silk thread may be swallowed by the patient several days prior to treatment, and the bougie holding the radium threaded on the silk thread. Simpson, in his work in 1922, reported that he had had encouraging results with radium treatments in all but the most hopeless cases; the difficulty in swallowing had been greatly relieved, resulting in increased weight and improvement in the general condition. In one of his cases apparent recovery was maintained for about a year when the patient died of cerebral hæmorrhage.

In the treatment of cancer of the œsophagus, Dr Mills of St Louis uses the X-ray for the localisation of the growth and the determination of the degree of stricture, and also as an aid in placing the radium. With his technique, the radium—usually 50 mg. of radium element—is enclosed in a container of German silver .5 mm. thick, and further filtered with .5 mm. of brass and a thickness of rubber. The container is mounted on a slightly springy-drawn silver wire encased in a rubber tube, and is introduced in the same way as an ordinary œsophageal sound. In certain cases where the abdominal œsophagus is involved the radium container may be encased in the rubber end of a rather small stomach tube, as this is more easily and safely passed around the rather abrupt curve of this portion of the œsophagus. The wire applicator or stomach tube is held by means of a bridle bandage about the patient's head, and the radium left *in situ* for six hours at each treatment. From one to seven treatments have been given.

In 1920, Mills reported 15 cases treated; no absolute cure was claimed, but one patient was alive and well two years and six months after the initial treatment, and another, one year and six months. No case failed to improve; the most immediate effect of treatment was relief of the dysphagia. This resulted in improved nutrition and a gain in weight in most cases. In several cases there was a return of dysphagia, but this could be relieved by another treatment. Dr Mills believed

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that the definite cure of cancer of the œsophagus by the use of radium, is a possibility, and that radium is the best palliative that has been suggested in these cases.<sup>7</sup>

Dr C. W. Hanford, of Cook County Hospital, Chicago, determines the position of the stricture in œsophageal cancer by means of the fluoroscope and by sounding with olivary bougies. He has devised a special radium carrier, which is easily held in place, and gives the patient little discomfort. The position of the carrier is determined by a Rœntenogram and verified later by the fluoroscope. Dr Hanford uses 50 mg. of radium with an exposure of eight to ten hours; the screen is brass, gold plated 1 mm. thick with 1 mm. thickness of rubber. As a rule treatment is repeated in three to four weeks. In a series of 15 cases treated by this method up to January 1922, Hanford had four "seeming cures;" all patients were benefited by the first treatment, especially by the relief of dysphagia, but if this symptom returns, the second treatment is not so effective. In addition to the four "seeming cures," five patients have shown no recurrence in a year, and are still under treatment. Radium treatment of cancer of the œsophagus, Hanford believes, is an advance of "more than a step" in a disease that was always fatal; some may be saved, the majority are benefited, and gastrostomy is avoided. The greatest need is a more perfect system of dosage.<sup>5</sup>

In a discussion before the New England Otological and Laryngological Society in Boston, 20th November 1921, Dr Greene of the Huntington Memorial Hospital stated that the "seed treatment" with radium emanations was used in cancer of both the larynx and the œsophagus at the Throat Clinic of that hospital. This consists in the insertion of small glass capsules containing 1 to 3 millicuries into the tissue of the tumour at intervals of about 1 centimetre. The instrument used for insertion is a simple trocar, varying in length and shape according to the location of the growth to be treated.

In cancer of the larynx Dr Greene has had three apparent cures in about 100 cases with the use of radium. He is of the opinion that surgery is indicated in the early stages of laryngeal cancer; surgery, supplemented by radium, in the later stages. In the œsophageal cancers, which are almost all at an advanced stage when first seen, there has been definite palliation for three or four months in all except cases at the upper end; in some cases the palliation was marked, but no cures could be reported.

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In a personal communication to the writer, Dr L. W. Dean, of the State University of Iowa College of Medicine, says: "Our results from the use of the radium for cancer in the œsophagus have not been satisfactory. We have had cases with temporary improvement, but we have not had the improvements that have extended over a period of a year to eighteen months as reported by others."

My own experience with radium in laryngeal and œsophageal cancer, which now covers a period of two and one-half years, has been made possible by the hearty co-operation of Dr George Stuart Willis, Director of the Department of Radiology at the New York Post-Graduate Hospital. To the members of the Laryngological Section the work may be of added interest, because all cases have been examined, diagnosed, and the application of the radium made by a laryngologist and one especially interested in endoscopy.

The statistics of the Radium Department have been placed at my disposal in the summary of cases, and the majority have been observed and treated by me in conjunction with Dr Willis. My previous experience in the use of radium had been limited to a few cases of papillomata of the larynx, up to my return from France in 1919. At that time the Radium Department was established at the New York Post-Graduate Hospital, and along with my intimate connection with bronchoscopy work it opened up a co-operate plan of action. It hardly seems necessary to emphasise the advantage of this method of examination and the ease with which it has been possible to apply radium in what to us seems a scientific manner. Precision in diagnosis and accurate localisation of the growth were made possible as well as the study of the progress of the disease and the results of the treatment. Advantage has also been taken of the Department of Roentgenology in charge of Dr W. H. Meyer. Preliminary fluoroscopic examinations, with X-ray pictures, have been made in all œsophageal cases, and in our early work a fluoroscopic examination was made immediately after the introduction to check the position of the radium tube.

The one thought in our minds in these combined efforts was the possibility of giving to radium and to the patient a definite scientific standing; this, I feel, has in part been accomplished, and I also feel that the work so started has been, and will continue to be, a stimulus to the other laryngologists and endoscopists to "carry on" and suggest modifications. At

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first, all examinations and applications of radium to the larynx were made by the method of suspension laryngoscopy; some cases are still treated by this method, but the majority are now examined and treated by direct laryngoscopy, using a Jackson instrument; advantage being taken of the comfortable position advocated by Dr Richard Hall Johnson of Baltimore. Examinations and applications to the upper part of the œsophagus or hypo-pharynx are made by the use of the writer's œsophageal speculum; lower down in the œsophagus by the œsophagoscope. A preliminary study is made of all cases, this includes a carefully taken history with a complete physical examination as well as blood elimination and metabolism tests.

To enlarge a little on our present methods of examination and treatment; all cases are admitted to the hospital for at least twenty-four hours. Local anæsthesia is the anæsthetic of choice—rarely is it necessary to use a general anæsthetic. A preliminary hypodermic injection of morphine and atropine is given one hour before the examination. The recumbent position, as devised by Dr Johnson, is used for both the larynx and œsophagus. The larynx and adjacent parts are easily exposed by the direct laryngoscope—a careful note is made of the local conditions first, for diagnosis and the amount of involvement of the structures, and subsequently, to note progress of the case.

At first, radium tubes were used in the treatment of laryngeal cancer, but the radium needles have been found more satisfactory, and have been used in all our later work. These needles are made of gold and a mixed alloy of nickel, silver and steel; they contain 5, 7.5, 10 and 12.5 mg. of radium; thus both the hard beta rays and the gamma rays are used. The needles are placed with great accuracy by means of the laryngeal forceps. Attached to the needle are two silk threads, to permit of easy removal, and also to avoid loss by reswallowing. The threads coming out of the mouth are held in place against the cheek by adhesive plaster. The parts are made aseptic by the use of a 25-per-cent. argyrol solution or a 2-per-cent. tincture of iodine, in order to avoid infection by the introduction of the needles through an ulcerated or already infected surface. The needles are used both within the larynx and in the surrounding area. An attempt is made to apply the needles so that each c.m. of the growth is exposed to radiation.

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Tracheotomy is avoided as long as possible; careful observation of the patient will usually avoid an emergency operation; and those in which a planned tracheotomy is performed usually have no complications. We do not fear the use of the needle within the larynx if the dosage is carefully watched; the tolerance of the larynx seems to me at times to be most remarkable. Six to eight weeks seem to be the best interval between the treatments—the first dosage may be more heroic than in subsequent treatments. The reaction after the second exposure seems greater than with the first. The internal application should be supplemented with an external pack—consisting of 100 or 200 mg. radium, distance 1 in., giving each area 1000 mg. hours.

For œsophageal cases a note is made in the operating room of the fluoroscopic findings as well as the examination of the X-ray plates at the time of the œsophagoscopy. Occasionally it has been necessary to use a general anæsthetic. The recumbent position of Johnson—taking advantage of the high-low method of Jackson—is used. In the hypo-pharynx and upper part of the œsophagus the writer's speculum is used. Lower growths are examined by the Jackson œsophagoscope. Here, again, a local application is made of a mild antiseptic in all ulcerative lesions. The placing of the radium tube in the exact position in the centre of the growth has been our next problem—the use of a tube with silk thread has been abandoned for the use of a tube attached to a wire carrier; this can be passed through the œsophagoscope to the proper point, and then the œsophagoscope is removed. The tube is made of gold 1 mm. in thickness, and, to absorb the irritating secondary rays, 2 mm. of pure rubber are used. The tube contains about 50 mg. of a bromide salt. The length of exposure varies in the different cases, but is usually from four to six hours. All cases report at intervals of two weeks for observation, blood examinations, and proper medication. Early gastrostomy, the writer believes, is of value in all obstructive lesions.

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<sup>2</sup> Lewis, F. O., *Ann. Otol. Rhinol. and Laryngol.*, xxx., p. 932, 1922.  
<sup>3</sup> Field, E., *New York State Med. Journ.*, xxii., p. 121, 1922; also, "Discussion of Dr Harris's Paper," *Laryngoscope*, xxxi., p. 905, 1921.  
<sup>4</sup> Freer, O. T., *Illinois Med. Journ.*, xl., p. 85, 1921. <sup>5</sup> Simpson, F. E., *Radium Therapy*, 1922. <sup>6</sup> Janeway, H. H., *Radium Therapy in Cancer*, 1917. <sup>7</sup> Mills, R. W., *Trans. Am. Gastro-Enterol. Assoc.*, 1920, 139.  
<sup>8</sup> Hanford, C. W., *Journ. Amer. Med. Assoc.*, lxxviii., p. 10, January 7, 1922.



## SEPTIC SINUS THROMBOSIS: ITS DIAGNOSIS AND TREATMENT.\*

By SIR WILLIAM MILLIGAN, M.D.

THE presence of a thrombus in the lateral sinus is, in effect, an effort on the part of nature to protect deeper seated and more vulnerable structures. The most usual site of its location is in the sigmoid section of the sinus; the next most frequent is the bulbar portion.

So long as the thrombus remains sterile no particular harm results, but when infected, as practically invariably happens within a few days of its formation, a state of affairs detrimental to the health and inimical to the life of the individual is at once established. That its presence is at times overlooked, and a diagnosis of typhoid fever, broncho-pneumonia or malaria is made, is unfortunately still too true.

The causative organism in cases of otitic origin is, in my experience, invariably the streptococcus and frequently the "streptococcus hæmolyticus"; that its virulence and its toxicity vary in different stages in the progress of the disease is, I think, undoubted.

I am disposed to think, however, that the ever varying anatomical structure of the temporal bone, and the relative position of the sinus to adjacent mastoid cells are of even more importance in the incidence of the disease than the virulence of the causal organism. A preliminary X-ray examination gives, in certain cases, a general idea of the geography of the petro-mastoid region and sinus groove; but, generally speaking, owing to the more or less acute illness of the patient, it is seldom applicable as a diagnostic aid. Thrombosis of the sinus is more likely to occur in the pneumatic than in the diploëtic variety of mastoid.

### Diagnosis.

In typical and in advanced cases diagnosis is, as a rule, not difficult; the remittent type of temperature, the rigors, the profound asthenia, the localised pain over the sinus, over the

\* A paper read at the Section of Otology of the British Medical Association, Glasgow, 27th July 1922, in introducing the Discussion on Septic Sinus Thrombosis.

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posterior triangle and along the course of the jugular vein, at times accompanied by torticollis and enlarged cervical glands, present an almost unmistakable clinical picture.

It is rare in infants and in old people ; it is met with at times in young children, and is frequent in adult life. The right sinus is more frequently involved than the left, and induces more severe symptoms than left-sided disease. Sinus infection is more common in males than in females. It is the atypical case and the latent case, both by no means uncommon, which present diagnostic difficulties to even the most experienced, and yet it is an early and accurate diagnosis which tells almost more than anything else in the successful treatment of this particular affection.

Atypical cases which, in my experience, are more frequently met with in children than in adults, are due at times either to dehiscences in the tympanic floor or to its extreme thinness with consequent infection of the bulb. In such cases, no demonstrable signs or symptoms of mastoid infection may be present. At other times, the presence of a forward sinus and an almost complete absence of mastoid cells is the responsible factor.

To await the development of the full array of classical signs and symptoms is merely to court disaster. An intelligent appreciation and anticipation of the course of pathological events will materially assist in helping to make an early diagnosis, and an early diagnosis should spell early operative interference in order to prevent the advent of general septic poisoning.

The stage at which sterility of the existing thrombus gives place to infectivity is the all-important phase of the disease and the one to which our thoughts should be mainly directed ; for, if only we could assure ourselves from clinical data of the precise moment at which this change takes place, the chances of saving the patient's life would be materially increased. It is to this problem that I desire more especially to direct your attention because it seems to me to be the all-important one.

On examining my records of intracranial complications secondary to purulent otitis media, I find that thrombosis of the lateral sinus occurs in, roughly speaking, 50 per cent. of the cases, while septic meningitis occurs in nearly 60 per cent. Both complications tend to be solitary complications ; but, whereas meningitis is almost invariably fatal, sinus thrombosis has, if operated upon at a sufficiently early stage, the merit of

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being more amenable to surgical interference than any of the other intracranial complications usually met with.

The special proclivity to sinus infection as a complication of purulent otitis media is, I hold, to be explained mainly on anatomical grounds, the actual position of the sinus being very inconstant, at times situated quite superficially and approaching close to the posterior meatal wall, at other times lying deeply and separated from it by a considerable thickness of cellular bone. In brachycephalics it is said to be situated farther forwards and outwards than in dolichocephalics.

In the first place, the peculiar and intricate structure of the middle ear tends to prevent free drainage of tympano-antral suppuration; in the second place, and as a direct consequence of the frequent absence of free drainage, the temporal bone is peculiarly prone to septic infection; while, in the third place, the relation of the lateral sinus to the mastoid antrum and to the numerous venous radicles which, running through the temporal bone ultimately enter it, renders it specially liable to organismal attacks.

The lateral sinus is peculiarly rich in various tributaries and receives—(1) many small veins from mastoid cells; (2) the mastoid vein itself; (3) certain diploic veins; (4) the superior petrosal sinus; and (5) veins from the cerebral and cerebellar cortex. Moreover, as the sinus is an interdural structure, it is consequently more vulnerable than a structure separated from an existing septic focus by the full thickness of a normal dura mater.

While thrombosis of the sinus almost invariably occurs as the result of a chronic infective process, it must be borne in mind, that it is by no means infrequently encountered during the acute stage of an otitis media when its presence is prone to be overlooked, the infective path being either directly along venous radicles between the middle ear and the sinus, or by way of small venous tributaries connecting the tympanic mucosa with the petrosal sinuses.

The temporal bone stands in a class by itself so far as its venous circulation is concerned. Many small venous tributaries, devoid of valves, enter the lateral sinus (a sinus, moreover, unprotected by a lymphatic sheath), after running a peculiarly short course. Purulent collections in the bone are, as a rule, under some degree of tension, a fact which tends to expedite the passage of bacteria.

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Thrombosis secondary to acute septic otitis media is, in my experience, however, less dangerous than when secondary to chronic otitis media. It also occurs in cases where there has been merely a fleeting tympanic suppuration or even no suppuration at all, or where it has entirely ceased and the previously ruptured membrane healed. This is due to the fact that in the course of the tympano-antral suppuration, the middle ear becomes occasionally entirely shut off from the antrum as the result of the fusion of granulation tissue in the "iter." I have seen several such anomalous cases myself, and others have been recorded by Mollison, Piolti Friedmann, Greenfield, and others.

It must also not be forgotten that thrombosis may suddenly appear years after the performance of a radical mastoid operation on adults, as the outcome of the breaking-down of a localised tuberculous focus. In such cases, tubercle bacilli may gain an entrance into the blood stream and become ultimately deposited in viscera, joints, etc. This particular, although rare, form of thrombosis has been described by Ballance as "Lateral Sinus Tuberculosis."

While sinus infection is usually due to extension of an existing bone lesion, it may also result from direct venous infection, *e.g.*, by way of an unobliterated petro-squamosal sinus, the primitive anterior segment of the lateral sinus by way of the petrosal sinuses, or as the result of pus spreading between the dura and the petrous pyramid upon either its anterior or posterior surfaces. The resulting phlebitis may end in the formation of mural thrombosis or in complete obliteration of the sinus. Thrombosis of periphlebitic origin is not only more gradual in its onset, on account of the frequent presence of a barrier of protective granulation tissue, but is also more likely to end in perforation of the coats of the sinus wall with the ultimate formation of an abscess in continuity with the area of suppuration within the mastoid cells.

Thrombosis of endophlebitic origin, where the infection is conveyed directly by the blood stream, is unattended for a considerable time by visible changes in the superimposed tissues or in the vessel wall; it produces general pyæmic symptoms more rapidly, and is thus the more dangerous type of infection.

Pyæmia may, however, result without any metastases; in other words, acute septic intoxication may result without any

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thrombosis whatever. It may also result from petrosal sinus infection secondary to purulent labyrinthitis without infection of the sigmoid sinus.

## Symptoms and Signs.

**Thrombosis of the Sigmoid Sinus.**—It is of the utmost importance that we should endeavour to discover from clinical signs and symptoms that phase of the disease where we have to deal with a non-infected clot, and that phase when the clot has become infected.

The presence of a non-infected clot is an actual safeguard, a protective agency, and if only the local disease be removed at the psychological moment, its presence need not give rise to anxiety. If, however, the focal disease be not removed at once, secondary infection of the clot is only a matter of a few days. In any case of middle ear suppuration, acute or chronic, where reasonable drainage exists, the occurrence of a rigor should always excite suspicion. It is a danger signal of the first importance. Moreover, the continuance of a high temperature for several days after a mastoid operation, especially if the patient be a child, should be regarded with equal suspicion.

The temperature record is, to my mind, one of the most important and reliable of diagnostic signs. To get real assistance from it an almost continuous record should be kept, but failing this, at least a two-hourly record. The swinging morning and evening temperature with which we are all so familiar certainly indicates that thrombosis is in full bloom, but what the chart ought to show and does show, if records are made frequently enough, is the time at which disintegration is taking place.

Sudden oscillations of more than one to one and a half degrees are unusual in uncomplicated suppurative mastoiditis, but frequent oscillations of from one to three degrees are quite common in commencing peri- or endo-phlebitic thrombosis, and their presence should at once put the clinician on his guard. In young people, among whom, as I have already stated, atypical cases are most frequently met with, temperature is a less exact guide than in adults, the tendency being for it to be continuously high rather than remittent. This fact sometimes marks the commencement of thrombosis in acute infectious fevers.

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The pulse rate varies more or less regularly with the temperature except in cases where an intracranial abscess is also present, when it may become almost unduly slow.

Too much stress is frequently laid upon the absence of rigors. Their presence, more especially if they recur frequently, is practically diagnostic, but their absence, providing certain other leading indications are present, should certainly not negative exploration. They occur only in about one half of the cases. So long as the system is capable of throwing off the accumulating toxins there is no special reason why there should be any rigors; when overcharged, however, rigors are frequent. In children they frequently are absent throughout the whole course of the disease.

Chills and a feeling of chilliness are very important symptoms too frequently overlooked, although they are present in nearly 80 per cent. of cases. Frequent inspection of the hands, feet, and knee-caps should be made, as they are often found cold when the temperature is quite high.

Profuse sweating is by no means always present. At first it occurs as the temperature is subsiding, but in very severe cases may be almost continuous.

Important information, too often ignored, is to be obtained from a daily examination of the retinal veins. Ocular changes occur in some 75 per cent. of sinus cases, but are frequently so slight, although so important, that they may not be appreciated unless frequent examinations are made. An actual neuro-papillitis, however, occurs in only about 30 per cent. of the cases. As the sinus becomes gradually occluded, the ipsolateral veins become slightly engorged owing to the venous "back-wash," the contralateral veins remaining normal.

A sudden diminution of engorgement indicates either that the thrombus has contracted or that it is breaking down, with the result that infective particles are being floated away in the blood stream. In the former event, no rise of temperature takes place, in the latter, it suddenly shoots up and may or may not be accompanied by a rigor.

For similar reasons the temporal, occipital, and facial veins, and at times the emissary mastoid vein may get blocked with resulting slight œdema or puffiness of the adjacent subcutaneous connective tissue. When the sinus is occluded the normal venous hum over the internal jugular disappears but is audible upon the opposite side.

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The sign described by Crowe is also at times of value. Pressure upon a normal internal jugular vein produces demonstrable dilatation of the superficial veins of the forehead, eyelids, and temples, and, to some slight degree, of the retinal vessels, whereas pressure upon an already obstructed jugular vein has no such effect.

If on exposure of the sinus it be found to have a dark bluish colour, it must not be taken for granted that no thrombus is present. In thrombosis of endophlebitic origin the walls retain for a considerable time their normal appearance, when of periphlebitic origin, however, their colour is usually grey or a yellowish grey, protective granulation tissue being also frequently present.

Pulsation of the sinus, synchronous with the respiratory movements, may or may not be present. Whether present or absent it is a sign of little value. Diagnostic information of value is, in my experience, very rarely obtained from a blood count.

The presence of a high degree of leucocytosis or of large numbers of mono-nuclear leucocytes is suggestive of pus, but by no means necessarily of pus in the sinus or even around it. When, however, associated with other suspicious symptoms it may be looked upon as a helpful aid.

Certain paralytic phenomena are also at times present, as for example, paralysis of the hypoglossal nerve from the pressure of a thrombosed condyloid vein as it emerges from the anterior condyloid foramen.

When thrombosis of the jugular bulb is present the existing pressure may cause paralysis of the vagus, spinal accessory or glossopharyngeal nerves.

Should extension to the cavernous sinus take place paralysis of the abducens, the oculo-motorius, or the trigeminus may result.

In advanced cases, such systemic complications as pulmonary abscess, gangrene of the lung, septic jaundice, renal or splenic infarcts, and infective enteritis are at times found.

**Thrombosis of the Cavernous Sinus** of otitic origin is undoubtedly a rare event. My own experience is limited to three cases, all of which were fatal. The path of propagation is along the superior or inferior petrosal sinuses when of otitic origin, when of nasal accessory sinus origin by way of the ophthalmic vein. The leading symptoms present are due either to the effects of venous obstruction or to pressure on nerve tracts.

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Œdema of the periorbital connective tissue with protrusion of the eyeball and limitation of its movements is usual. Extension to the opposite sinus takes place in about one half of the cases, the circular sinus acting as the "via media." When this occurs, and it may occur very rapidly, there may be a retrogression of symptoms so far as the eye first affected is concerned. The nerves usually involved are the second, third, fourth, and sixth, and first division of the fifth. Marked supra- or infra-orbital pain may be present. In exceptional cases it is occipital or over the vertex. Ptosis, strabismus, and pupillary reaction may be present, in the early stages myosis, later on stable mydriasis. Choked disc and complete ophthalmoplegia are to be noted at times.

The following triad of symptoms is pathognomonic of commencing cavernous sinus thrombosis, viz., high and remittent temperature, meningeal irritation, and commencing exophthalmos. In exceptional cases œdema of the pharynx and tonsillar region of the same side may be found.

**Petrosal sinus thrombosis** from direct extension is frequently associated with sigmoid sinus thrombosis. Thrombi may, however, be present in each vessel arising independently. It may result from cavernous sinus thrombosis due to ocular or nasal causes, or, as is more frequent, from extension of sigmoid sinus thrombosis of otitic origin.

In the former case the path of propagation is with the blood stream, in the latter against it. As a pathological entity it is probably never diagnosed as such.

In cases of purulent labyrinthitis, however, where the temperature begins to oscillate somewhat violently, it is well to think of the possible involvement of the superior petrosal sinus, as if this sinus is involved cavernous or sigmoid sinus thrombosis is almost certain to follow.

## Differential Diagnosis.

The disease with which sinus thrombosis is most likely to be mistaken is, in my experience, typhoid fever. During the first week of an attack of typhoid many of the symptoms are almost identical with those of sinus thrombosis, and if by chance the patient happens at the same time to have a suppurating ear confusion becomes confounded. The presence, however, of a Widal reaction and petechiæ, and the absence of very marked



## Septic Sinus Thrombosis

variations of temperature with rigors or chills, are, as a rule, sufficiently distinctive.

At times it is difficult to distinguish thrombosis from a central broncho-pneumonia. The persistent cough, the rusty sputum, and the more even temperature serve, however, as useful differential diagnostic aids. From malaria it is to be distinguished by means of a blood examination and the discovery of the *plasmodium malarie*.

In rare cases in infants and young children severe gastric attacks, especially if at the same time the patient has running ears, are liable to mask an existing thrombosis and to confuse diagnosis.

While all will probably agree that typical cases present no great difficulty in diagnosis, all will, I think, equally agree that atypical and latent cases present extremely complex problems to the clinician. The value of an early and accurate diagnosis cannot be overestimated. My own practice is to attempt to unravel the complexities of the case as far as possible from clinical signs and symptoms, but when reasonable doubt exists, I have no hesitation in performing an exploratory operation in exposing or actually slitting up the sinus purely and solely for diagnostic purposes. I have never had any reason to regret adopting this course of action, and have on quite a number of occasions had every reason to be thankful for having adopted it. Surgical surprises are still not uncommon in even the best regulated clinics, and the old adage *humanum est errare* is quite as true to-day as it was in days gone by.

# THE IDENTIFICATION OF THE LARVÆ OF THE DIPTERA (FLIES) WHICH CAUSE NASO- PHARYNGEAL AND AURAL MYIASIS IN MAN.

By MAJOR W. S. PATTON, M.B.(Edin.), F.E.S., I.M.S. (Retd.), Lecturer  
on Entomology and Parasitology, Edinburgh University.

THE practitioner in the tropics sees many cases of myiasis, but seldom attempts to determine even the genus of flies to which the larvæ belong, and in very rare instances preserves specimens for submission to an expert. As a result, a large amount of valuable material, the preservation of which would lead to a better knowledge of these serious pests, is annually lost. The reason for this is not far to seek. The information on the subject even in the most up-to-date books on Tropical Medicine is not of a practical nature. Long lists of names of flies, whose larvæ have been found in various tissues and organs are usually given, but these are, as a rule, meaningless to most medical men. No mention is made as to how the various larvæ can be identified, and, after all, this is the most important side of the subject. It is not to be wondered then that the busy practitioner in the tropics is discouraged from making any contribution to the subject. Unable to find any information on the distinguishing characters of the different larvæ, he, as often as not, sees no use in even collecting and preserving them.

The object of the writer in the present article is to fill this hiatus by giving just that information which is omitted, even in books on Medical Entomology, and which will enable anyone, with the minimum amount of trouble, to determine not only the genus of flies to which the larvæ belong, but in most instances the species. It is believed that this information will stimulate more extensive collecting and preservation of material. The article is written particularly for the specialist in the Diseases of the Nose, Ear, and Throat, who sees many cases of myiasis of these organs. It is assumed that the reader knows little or nothing of the subject of myiasis and of the larvæ which cause it.

In a recent paper on the "Myiasis-producing Diptera of Man and Animals," the writer defined the term myiasis as, "The condition or conditions resulting from the invasion of

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the tissues and organs of man and animals by all the stages of the Diptera." In books on Tropical Medicine myiasis is usually dealt with from the standpoint of the tissues and organs invaded, and classified under rhinal, aural, oral, ocular, cutaneous, subcutaneous, vaginal, and gastro-intestinal myiasis. This method of dealing with the subject is not only unscientific but leads to endless confusion, for the same larva may be found in more than one organ and in wounds and cuts of all kinds. The larvæ of *Chrysomya bezziana*, the Old World screw-worm fly, for instance, may be found in all the above-named cavities and in all forms of cutaneous and subcutaneous myiasis. In his previous paper the writer pointed out that the subject of myiasis is best studied from the standpoint of the flies themselves, which may be classified as follows:—

**I. The Specific Myiasis-producing Flies.**—Those species which only lay their eggs or deposit their larvæ, as the case may be, in living tissues.

**II. The Semi-specific Myiasis-producing Flies.**—Those species which, though normally laying their eggs or depositing their larvæ in decomposing animal and vegetable matter, occasionally place them in living tissues.

**III. The Accidental Myiasis-producing Flies.**—Those species which normally lay their eggs or deposit their larvæ in stale and decomposing vegetable and animal matter. Many human foodstuffs are suitable breeding-grounds for these flies, and if they are not properly protected, washed, or cooked, become infected, and the larvæ are often accidentally ingested, and are able to live in the intestines. We are here, however, not concerned with this group, and it will not be referred to again.

## **I. The Specific Myiasis-producing Flies.**

The species belonging to this group naturally fall into two smaller groups as follows:—

(a) The species which oviposit or larviposit on the human body being attracted to do so by offensive odours emanating from diseased tissues, such as foul cancerous and other ulcers, neglected wounds, etc., or by discharges from a diseased nose or ear, etc. At present only two flies are known to have this remarkable habit, one a blue-bottle, *Chrysomya bezziana* (Villeneuve), which is widely distributed in the Malay Peninsula, India, Burma, Assam, Ceylon and throughout Tropical

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Africa; the other a flesh-fly, *Wohlfahrtia magnifica* (Schiner), which is widely distributed in South Russia, Asia Minor, Palestine, and Egypt. These two flies never breed in the dead bodies of animals and are obligatory sarcobionts. The larvæ of both are commonly found in many diseased tissues and organs of the human body, and particularly in the nose and accessory sinuses. Although diseased tissue or organs are in the majority of the cases a necessity before infection takes place, both these flies will either oviposit or larviposit in a recent wound apparently attracted by the smell of shed blood; and a bleeding nose is frequently the starting-point of nasopharyngeal myiasis. But neither *Chrysomya bezziana* nor *Wohlfahrtia magnifica* deposit their eggs or larvæ on unbroken skin.

(b) The second group of the specific myiasis-producing flies contains all the well-known warble and botflies of man and animals. These flies lay their eggs on specially selected parts of the body of their own particular hosts, or as in one species, *Dermatobia hominis*, on other flies which frequent the bodies of man and animals; or they deposit their larvæ at the entrances to the nose. Their larvæ, like those of the first group, feed on the fluid which surrounds them, which is largely produced by irritation and by their toxic salivary secretions. Infection may be massive as in the case of the common horsebot, *Gasterophilus intestinalis*, or single as in the case of the Thumbu-fly, *Cordylobia anthropophaga* of Africa, but in either case there is never gross destruction of tissues. In the species of the first subgroup infection is nearly always massive and the destruction of tissue extensive and often serious. The larvæ of only two species of botflies are likely to be found in the human nose. One is the common nosebot of the sheep, *Oestrus ovis* (Loew), and the other the nosebot of equines, *Rhinæstrus purpureus* (Brauer). The larvæ of the former are more commonly found in the human eye.

### II. The Semi-specific Myiasis-producing Flies.

In this group are included a number of flies belonging to several different families, but all of which normally lay their eggs or deposit their larvæ, as the case may be, in decaying vegetable and animal matter. Their larvæ are the great scavengers of nature, for they dispose of the unburied bodies

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of fowl and beast. The reader has doubtless at one time or another seen the loathsome, squirming maggots of the common European blow-fly, *Calliphora erythrocephala* (Meigen), which disposes of all the dead bodies of birds in our gardens. Unfortunately, however, many of these blow-flies have changed their habits, and others are in the process of doing so, and in addition to breeding in dead animal matter they regularly breed in living tissues attracted to them by offensive odours. The sheep-maggot flies, some of the most serious pests of the stock-breeder in Australia, are good examples of species of this group; and in Scotland, *Lucilia sericata* annually takes a heavy toll in wool and sheep.

In India, Africa, and in North and South America many of these flies, in addition to breeding in decaying animal matter of all kinds, often oviposit or larviposit in or near diseased human tissues, exactly as do *Chrysomya bezziana* and *Wohlfahrtia magnifica*. They are obligatory necrobiots, but have become facultative sacrobiots. They are the most serious myiasis-producing flies, as their breeding-grounds are so extensive. In addition to many blue-bottles which have developed this habit, there are several flesh-flies belonging to the genus *Sarcophaga*, and one or more species of the Phoridae, particularly *Aphiochaeta scalaris* (Loew). We know very little about the species of this group from the myiasis-producing standpoint. The distinguishing characters of their larvæ have, in most cases, not been noted. And we certainly do not understand why they have changed and are still changing their habits. Any of the larvæ of these flies may be found in the human nose and the ear, and the following species are known to cause human myiasis.

*Chrysomya megacephala*, Fab. (*dux* Esch; *flaviceps*, Macq.)

*Chrysomya albiceps*, Wied., and its varieties *putoria*, Wied., and *rufifacies*, Macq.

*Chrysomya macellaria*, Fab. (*viridula*, Rob-Des.)

*Chrysomya marginalis*, Wied.

*Lucilia cuprina*, Wied. (*argyrocephala*, Macq.)

*Lucilia madagascarensis*, var. *tæniops*, Bigot.

The common blue-bottle of the Oriental and Australian regions.

Common blue-bottle of the Ethiopian, Oriental, and Australian regions.

The common screw-worm fly of the New World.

A common blue-bottle of Africa and N.W. India.

The common small green-bottle of the Ethiopian and Oriental regions.

A common small green-bottle of Africa.

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*Lucilia sericata*, Meigen.

The common European sheep-maggot fly.

*Sarcophaga ruficornis*, Fab.

One of the common flesh-flies of the Oriental region.

*Sarcophaga chrysostoma*, Wied. }

*Sarcophaga plinthopyga*, Wied., }

And many other species of this genus.

Two common New World flesh-flies.

*Aphiocheta scalaris*, Loew (*repicta*

de Meij; *xanthina* Speiser;

*ferruginea*, Brunetti).

A small fly widely distributed in the Oriental, Ethiopian, Nearctic, and Neotropical regions.

### Naso-Pharyngeal and Aural Myiasis.

We are now in a position to consider shortly the clinical history of a case of naso-pharyngeal and aural myiasis respectively. As the methods of invasion by *Chrysomya bezziana* and *Wohlfahrtia magnifica* are typical of the oviparous and larviparous species of the specific and semi-specific myiasis-producing flies, they will be taken as examples. The history of a case of naso-pharyngeal myiasis produced by the larvæ of these two flies is something like this. The patient has an offensive discharge from the nose due to diseased bone or other cause, or has simply had nose bleeding, and while sleeping out in the open during the day, a female *Chrysomya bezziana* or *Wohlfahrtia magnifica*, attracted by the smell of the discharge, or that of the blood, alights on the upper lip or the nose. The former lays within one nostril a mass of from 400 to 500 eggs with the aid of its long ovipositor; the latter, a dozen or more larvæ just within the opening. The eggs of the former hatch out in about twenty-four hours, and the larvæ at once migrate up the nostrils, as do those of *Wohlfahrtia*, and begin to feed on the discharge. They soon make their way into the antrum, and as the result of secondary bacterial infection and their toxic salivary secretion, for these larvæ can only imbibe fluids, the tissues rapidly break down. The septum nasi is soon perforated and the larvæ pass into the other nostril. The discharge now becomes much more profuse and stained with blood. The nose, eyelids, and cheeks become swollen, and the patient complains of a headache, intense irritation at the back of the nose, frequent lachrymation, and the breath is always extremely fetid.

A patient exhibiting these signs and symptoms is very typical of a case of nasal myiasis, and if energetic treatment is taken at once most of the larvæ can be got rid of. But if the

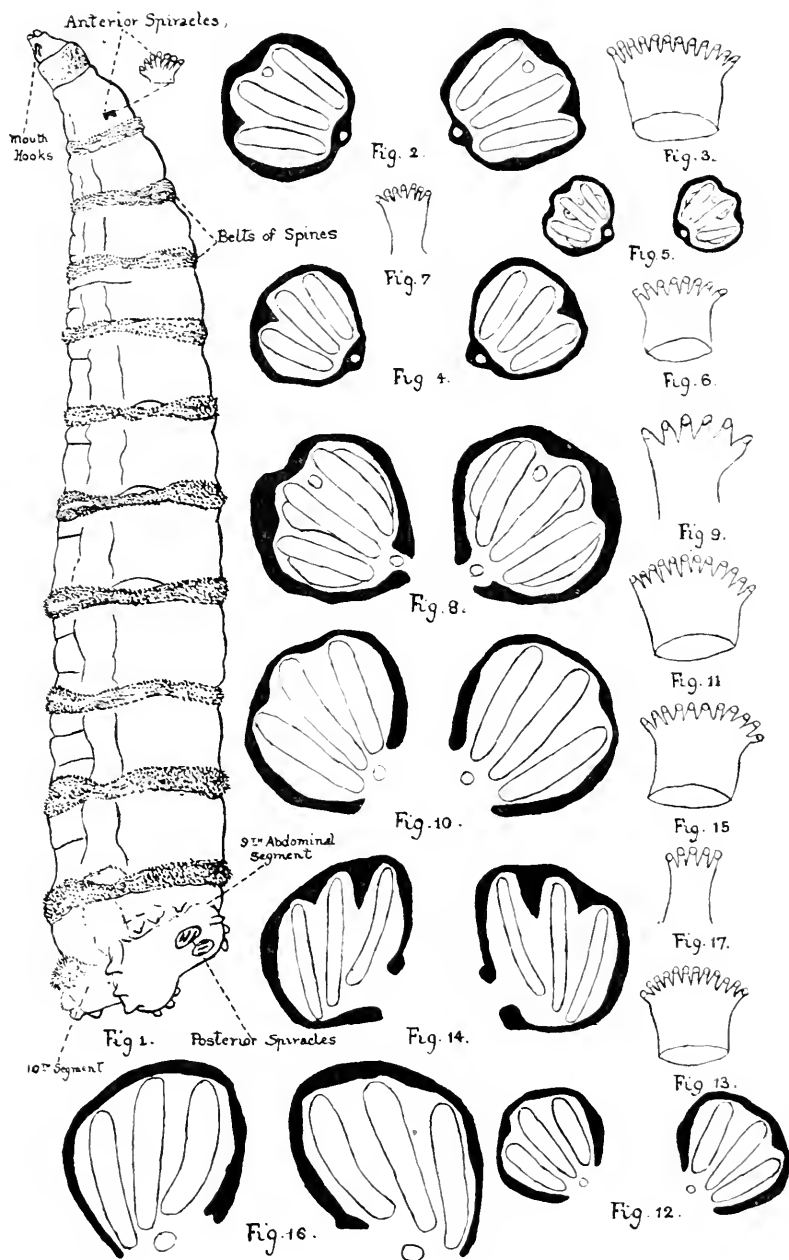
## Diptera which cause Myiasis in Man

patient does not seek medical advice, and this is more usually the case in the East, the larvæ migrate still further into the accessory sinuses, and soon the floor of the nose becomes destroyed and perforation of the palate follows. The discharge is very offensive at this stage, and if the infection is a heavy one the patient may suffer from some fever and great exaggeration of the symptoms mentioned above. As often as not, some larvæ now make their way into the mouth, and the patient for the first time becomes aware of the nature of the condition and seeks medical advice. No difficulty will now be experienced in removing some larvæ from the sloughs in the palate. In an advanced case of this kind the destruction of the tissues may be very extensive, and many years ago Dr Patterson recorded a case of naso-pharyngeal myiasis in a coolie woman in Assam, caused by the larvæ of *Chrysomya bezziana*, which resulted in the complete destruction of the nose and part of the face, and death from exhaustion.

Rhinal or naso-pharyngeal myiasis is commonly known as "Peenash" in North India, and is a very common condition. Treatment of these cases should aim at getting rid of the larvæ as soon as possible in the living condition, and frequent douches of weak chloroform water and the local application of turpentine are of great use in this direction; these substances irritate the larvæ and cause them to crawl out. Nothing should be used which will kill the larvæ *in situ* as they are then always a source of secondary and often serious septic infection. If the case is seen early, recovery is usually complete with little or no serious destruction of tissues. People suffering from ozæna, or who have frequent nose bleedings, should be warned of the danger of infection with the larvæ of either of these two flies, and the nostrils should be plugged with cotton-wool soaked in some antiseptic.

In a case of aural myiasis there is much the same sequence of events. The patient has a discharge either from the external or the middle ear; and the eggs of *bezziana* are laid well within the opening and the larvæ of *magnifica* are deposited just at the external meatus; or, as in one case which came under the writer's notice, the eggs of *Chrysomya bezziana* were deposited in a recent ring perforation in the lobe of the ear. The destruction of tissues is very rapid, but, owing to the pain and discharge, these patients usually seek medical advice at once. It should be noted that the larvæ of all these flies are

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quite unable to eat their way through bone, and therefore they can never reach the brain.

## The Identification of the Larvæ.

Before describing the distinguishing characters of the larvæ of the myiasis-producing species of the different groups mentioned above, it is necessary to refer briefly to the structure of a fly larva or maggot, and to draw attention to the special points used in identification.

The larva of a blow-fly (Fig. 1) when full-grown is elongated and consists of a number of segments, the anterior ends of which are thickened and provided with one or more backwardly directed spines arranged in rows and of various sizes depending on the species. The remainder of each segment may be either smooth or covered with minute spines. The anterior end is attenuated, and though no distinct head is visible, it is provided with a mouth and a pair of large, dark, recurved hooks. The body segments gradually enlarge from before backwards; the hind end may be either more or less obliquely truncated or it may be deeply cleft. All these larvæ possess two important structures which are of great use in identification. At the anterior end, on each side of the apparent third body segment, there is a small, yellowish, fan-shaped structure, which is best seen when the larva is fully extended, as shown in the figure and which, when examined with a high power, is seen to consist of a number of small finger-like processes, each of which has an opening at its end. This is the anterior spiracle, and as the openings of the processes are patent in these larvæ they can respire through them. The number of processes, though somewhat variable in the same species, is sufficiently constant to be of great use together with certain other characters, to be mentioned presently, in determining the species.

At the broad end of the larva on the oblique face, or in a deep cleft between two lips on the apparent ninth abdominal segment, there is another pair of respiratory openings known as the posterior spiracles or stigmata. Each consists of a round or oval plate of dark-brown chitin enclosing three slits which are guarded by fine chitinous processes. These open into a common chamber, the atrium, which is continuous with the breathing-tube of each side; the fine processes prevent the entry of any foreign matter into the breathing chamber. The

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shape, size, distance apart, and the structure of the rims of the plates, together with the shape and direction of the slits, and the position of the small, knob-like structure, the so-called button area, are the important points to be noted in distinguishing the larvæ of the different species. In addition, the structure of the ninth segment should be noted, particularly the characters of the fleshy-pointed processes along its margin, and the extent of the two lips in the case of those larvæ in which the posterior stigmata are situated in a deep cleft. The extent

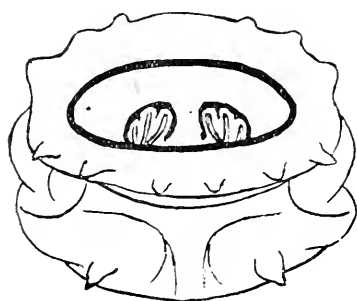


Fig. A

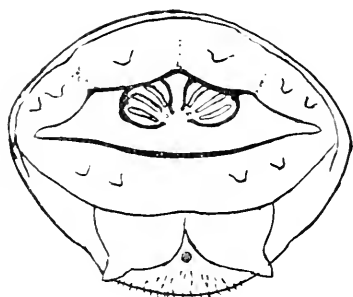


Fig. B

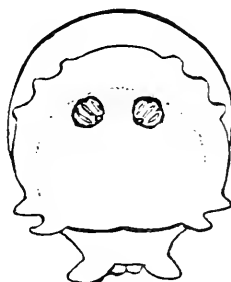


Fig. C

and structure of the cutaneous spines on the body segments are most important characters in the identification of the larvæ of the myiasis-producing flies. The general structure of a blow-fly larva is shown in the drawing.

This short description, together with the figure, should enable anyone to recognise the larva or maggot of a fly when he sees one. The genus can be recognised by noting the following points. If the posterior stigmatic plates are comparatively large and enclosed either in a shallow cleft or a deep hollow, and almost completely or entirely enclosed by the overhanging lips of the ninth segment, the larva is either that of a species of

# Diptera which cause Myiasis in Man

*Chrysomyia*, *Sarcophaga*, or *Wohlfahrtia*. If the plates become visible on pressing the posterior end of the larva, and they are more or less D-shaped, with three brown slits directed downwards and inwards, the larva is that of a species of *Chrysomyia* (Fig. B). If the plates are buried in a deep cleft and only just become visible on firm pressure, the larva is almost certainly that of a species of *Sarcophaga* or *Wohlfahrtia*. The external and middle slits are more or less straight, while the internal slits are comma-shaped, and are directed outwards and downwards (Fig. A). If, on the other hand, on examining the posterior end of the larva it is noted that the stigmatic plates are exposed without compressing the end, and that they are relatively small, round or slightly pear-shaped, the larva belongs either to the genus *Calliphora* or *Lucilia* (Fig. C).

The genera and species can only be determined with certainty by examining a caustic potash preparation of the posterior stigmata. Illustrations of the anterior and posterior stigmata of the larvæ of *Calliphora*, *Lucilia*, *Chrysomyia*, *Sarcophaga* and *Wohlfahrtia* are given in Figs. 1-17.

In conclusion, the writer would like to say that he will be glad to help any medical man in the identification of larvæ from cases of myiasis.

## DESCRIPTION OF FIGURES.

1. The full-grown larvæ of a species of *Lucilia*, modified after Patton.
2. The posterior stigmata of the full-grown larva of *Calliphora erythrocephala*.
3. The anterior spiracles of the same.
4. The posterior spiracles of the full-grown larva of *Lucilia sericata*.
5. The posterior spiracles of the full-grown larva of *Lucilia cuprina*.
6. The anterior spiracles of the larva of *Lucilia sericata*.
7. The anterior spiracles of those of *Lucilia cuprina*.
8. The posterior spiracles of the full-grown larva of *Chrysomyia bezziana*.
9. The anterior spiracles of the same.
10. The posterior spiracles of the full-grown larva of *Chrysomyia megacephala*.
11. The anterior spiracles of the same.
12. The posterior spiracles of the full-grown larva of *Chrysomyia macellaria*.
13. The anterior spiracles of the same.
14. The posterior spiracles of the full-grown larva of *Sarcophaga ruficornis*.
15. The anterior spiracles of the same.
16. The posterior spiracles of the full-grown larva of *Wohlfahrtia magnifica*.
17. The anterior spiracles of the same.
- A. Posterior end of a larva of *Sarcophaga*.
- B. Posterior end of the larva of *Chrysomyia bezziana*.
- C. Posterior end of the larva of *Lucilia*.

# CRITICAL REVIEW

## SPASMODIC RHINITIS.

By SIR ST CLAIR THOMSON.

"THE best occupation during a railway journey," said Thomas Carlyle, is "to sit still and number your thoughts." A similar opportunity for taking stock of a subject is often afforded by the publication of a French thesis for the M.D. These *Thèses de Paris*—or, for that matter, of any of the French universities—are always well worth reading, if, for no other reason, for the order, precision, logic, and clarity with which the subject is presented. To read any one of them is, in itself, a lesson in essay writing. They always appear to make the matter interesting, briefly bringing the history of it down to the present date, stating clearly the problem still to be dealt with, and suggesting the lines along which advance may be expected. The original part of a French thesis may, or may not, be of value, but clearness of expression and "sweet reasonableness" can always be counted on. Immaturity does not offend us, for each *Thèse* is both inspired and controlled by the teacher in whose service the graduate has prepared his material.

Having recently heard Professor Widál deliver his interesting address before the University of London on anaphylaxis, it was a great pleasure to receive from Dr Georges Dhers a copy of his graduation Thesis on "Aperiodic Spasmodic Rhinitis, and its Treatment by desensitizing Autoserotherapy."<sup>1</sup>

From this, it is clear, that these non-inflammatory discharges from the nose are becoming more frequently met with, and are no longer such a special attribute of the Anglo-Saxon race as to merit the title formerly employed of *Asthme-hay des Anglais*. In studying them we are met at the threshold with the confusion brought about by unsatisfactory nomenclature. "The only thing wrong with the title 'Hay Fever' is," said some wag, "that there is no fever about it, and it is not always caused by hay"! So with the other names of these nasal discharges. "Rhinitis" means inflammation of the nose, which is never present: "spasmodic," "vaso-motor," and "nervous," when used to define it, postulate causes which are not constant: and "paroxysmal sneezing" lays stress on one symptom which may be trifling or absent. Still, we do not appear to be able to escape from the term "rhinitis," and a serviceable classification can be based on the symptoms.

We may group our patients into three categories:—(i.) Some suffer from a watery discharge from the nose, more or less permanent,

## Spasmodic Rhinitis

without sneezing or lachrymation. They have "Nasal Hydrorrhœa." (ii.) A second group have genuine "Hay Fever"; they manifest the symptoms of sneezing, lachrymation, and profuse watery discharge at a certain season of the year, and the exciting cause can be traced to definite, vegetable irritants. (iii.) Others are subject to a nasal flux, at any time or in any place. Their attacks may be daily, or several times a week, and they are rarely a whole week free. This we may call "Spasmodic Rhinitis," and the addition of the adjective "aperiodic" helps to differentiate it clearly from hay fever.<sup>2</sup>

So far, so good. This classification is not very satisfying; but it helps us to get on with our task, for, as Claude Bernard said, "*ce serait une grande illusion du médecin que de croire qu'il connaît les maladies pour leur avoir donné un nom.*" The public—fortunately for their peace of mind—appear to derive much grateful comfort from a mere title which appeals to them, and hence the satisfaction with which they receive such terms as "catarrh," "congestion," "debility," "inflammation," and so forth. The physician, on the other hand, is not able to—as the French phrase has it—"pay himself with words."

"Periodic Catarrh" seems to be as good a term as "Spasmodic Rhinitis," and it was under the former title that this condition was first described by Heberden of Guys' Hospital in 1802 and by Bostock in 1819. Our German colleagues gave the latter due credit by calling it *Bostock'sher Katarrh*. As is usual with pioneers, they had their forerunners. In his book on Hay Fever, an interesting historical sketch of the subject is given by the late Eugene Yonge of Manchester.<sup>3</sup> He shows that in the year 1565, Botallus pointed out that the perfume of roses produced sneezing and violent headache in certain individuals. In 1673, Binningerus treated a lady, who was subject to violent catarrh, when roses were in bloom; she evidently was not of the lean and spare neurotic type, for she is described as *ampli corporis et carnosi*. The great von Helmholtz was a sufferer from hay fever, and suggested that it was provoked by the organisms which were stirred into activity by the heat of the summer months (1869). Bostock, also, was himself a patient; he published a very full work on it, and gave it the name of "summer catarrh."

The history of the treatment of hay fever, spasmodic rhinitis, and nasal hydrorrhœa is not very interesting. Most of our patients have run the gamut of various intranasal operations and applications, including the galvano-cautery, hot air, and resection of nerves, with symptomatic treatment by belladonna, strychnine, and so forth. One cannot help wondering how much of the benefit—when there was any—was due to suggestion, or asking whether these various methods of treatment did not merit the same gibe as homœopathy, viz., that it kept the patient interested while nature cured him! Latter day

## Sir St Clair Thomson

medication of genuine Hay Fever by specific treatment with pollen extracts—from the “Pollantin” of Dunbar in 1905 to the present day “Pollaccine” of Almroth Wright—need not detain us. We know the cause, and we are on the track of the cure. Besides, the thesis under our consideration is only concerned with Spasmodic Rhinitis.

On the etiology of this Dr Dhers is wisely open-minded. He says that the specific cause is unknown, or, rather, that there exist as many causes as patients. Before the days of anaphylaxis we had to fall back on that blessed word “idiosyncrasy.” Now, we can consider the condition as an anaphylactic rhinitis. The sensitising substance may come from the outside or from the patients’ own organism; but in the majority of cases it is unknown. General reasoning suggests that it is the expression of an undetermined anaphylaxis.

An interesting part of this thesis is the author’s investigation on the modification of arterial pressure following on the injections of autoserum. Taken with the well-known instrument of Pachon the readings show a regular fall of a  $\frac{1}{2}$  to  $1\frac{1}{2}$  degrees, twenty minutes after each injection.

The technique of the treatment by the autoserum is very simple. Twenty c.c. of blood are withdrawn from the patient’s vein. This will yield 5 to 6 c.c. of serum, which is sufficient for a first series of injections. The blood, drawn into a test-tube—with the strictest asepsis, it need hardly be said—is corked with sterile cotton, and left at the ordinary, indoor temperature for six to twelve hours. At the end of that time it is easy, by a few light taps, to detach the clot from the walls of the tube and transfer the serum to another tube. Here it should be protected from daylight.

The injections are made under the skin of the thigh or arm, beginning with half a c.c., six to eight hours after the blood has been collected. Next day, 1 c.c.; the third day  $1\frac{1}{2}$  c.c.; the fourth day 2 c.c.; and the following days  $2\frac{1}{2}$  c.c. till the eighth injection. No local or general disturbance need be feared, and the patient can continue his everyday habits.

Seventeen patients were submitted to this treatment, and a full description of them can be read in the brochure. As a result there were 11 cures, 1 marked improvement, and 5 were unaffected. The author is judicious in not attempting to explain these 5 failures; he states that the cases were not more severe than many of the 11 which were cured. It is well to point out that all the 17 cases were treated within the year 1921. We have to see if the cure is lasting. Anyhow, to obtain relief for 11 out of 17 typical cases is a very satisfactory record.

It was a cynical French writer who said, “Employez vite ce remède pendant qu’il guérit encore.” Without being quite as sceptical, we may

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be glad of giving a trial to a method which is free from risk and logically justifiable.

The thesis concludes with a useful bibliography.

## REFERENCES.

<sup>1</sup> *La Rhinite Spasmodique Apériodique et son Traitement par l'Autoséro-therapie désensibilisatrice.* Dr Georges Dhers, Assistant d'Oto-Laryngologie de l'Hôpital Bon-Secours. 1922. Paris: Jouve & Cie, 15 rue Racine.

<sup>2</sup> The author of this thesis does not mention Cerebro-spinal Rhinorrhœa. We may therefore defer its consideration to a later review, particularly as little has been added to our knowledge of the condition since I first described it in 1899.

<sup>3</sup> *Hay Fever and Paroxysmal Sneezing.* Eugene S. Yonge. London: William Green & Sons, 1910.

## SOCIETIES' PROCEEDINGS

### ROYAL SOCIETY OF MEDICINE—SECTION OF OTOLOGY.

October 20, 1922.

*President*—Mr HUNTER TOD, F.R.C.S.

*Chairman*—Sir CHARLES BALLANCE, K.C.M.G., C.B., M.V.O., M.S.

**An Attempt to Standardise Tests for Hearing**—SOMERVILLE HASTINGS, M.S., and Major W. S. TUCKER, R.E.

Mr SOMERVILLE HASTINGS said that several years ago a Sub-committee of the Section spent a good deal of time investigating the tests usually employed in the examination of deaf people, and in endeavouring to determine which were of most value.\* None of the methods usually employed for estimating the hearing power of an individual, for instance the tuning fork, conversational voice, whisper, acoumeter, appeared to be really satisfactory. They were all influenced by the relation of the ear to the waves of sound, reflections from surrounding objects and interference by extraneous sounds. Moreover, it was difficult or impossible to maintain the same source of sound in different observations.

About three years ago Major W. S. Tucker invited him to join in trying to work out some better method of the estimation of the hearing capacity. Major Tucker, whose method of locating German guns by the sound of their firing had done so much to win the war, was desirous of estimating the hearing capacity of aeroplane listeners.

They had tried a good many different methods, and the apparatus

\* *Proceedings*, 1917-18, xi. (Sect. Otol.), p. 4.

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shown to-day will need certain modifications to fit it for clinical use. It depends on the following principle: A wireless valve can be made to give out vibrations of any frequency. The count from the valve passes to a telephone by means of a Wheatstone's bridge, and resistances are interposed until the sounds are no longer heard. Its advantages are: (1) That the test is but little affected by slight extraneous sounds; (2) that a pure sound of any frequency and intensity can be obtained; and (3) that the amount of energy set free by it can be determined.

J. P. Minter, in the *Physical Review* of February 1922, described a similar method, and gave extensive results but very few details of the apparatus used.

He asked Major Tucker to describe the apparatus in detail, and to demonstrate the test on an individual.

Major W. S. TUCKER, R.E., said that one of the new operations required of the fighting services during the war was that of listening for enemy aircraft. In general, the personnel for this work was selected in a very casual kind of way, and the chief qualification seemed to be the general unfitness of the men for any more strenuous occupation. In the later stages, some crude tests were applied to select the best men, but proficiency and intelligence in listening were not recognised by any increase of pay. The installation now to be described was designed primarily for testing such listeners, and it is hoped that there will be a listening qualification properly recognised—for it is an occupation requiring careful training, skill, and intelligence.

Our efforts towards producing a standard of good listening were brought to the notice of Mr Somerville Hastings, and his interest in the matter has resulted in our modifying our designs, so that, if satisfactory, they can be employed on the deaf.

The following considerations determined the form of this apparatus:—

(1) The sound must be that of a pure musical note for whatever part of the scale the ear has to be tested.

(2) It must be reproducible as regards pitch and intensity from day to day.

(3) There must be a logical scale of intensity.

(4) The signals conveyed to the ear must be intermittent at will, and some indication, other than oral, must be given by the listener so that no sound interferes with the process of listening.

(5) The sound should be produced so close to the ear that intensity of the sound cannot be affected by reflections within the room.

(6) Outside disturbing sounds should be avoided.

(7) The process of getting the limit of acuity should be a rapid one, to prevent the subject from educating himself too well to the operation of listening, or from losing acuity through fatigue as the result of concentrated effort.

Since electrical methods are in general so well under control, an electrical method was selected, and the sound was generated by an oscillatory electric current actuating the diaphragm of a telephone.

Recent wireless research has presented us with an excellent generator of oscillatory electric current.

The important constituent of this is the wireless valve, in which the



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space inside is rendered a conductor of electricity by the particles or electrons emitted from an incandescent filament. If a battery be used as a supply of current and be connected to a metal plate and the hot filament in the valve, an electric current will pass. If a metal wire screen be interposed between the filament and the plate, the current will stop, but if in some way a small alternating voltage be applied between the filament and this screen (called the grid)—the grid now allows the current between the filament and metal plate to pass with very much increased intensity. Here the grid and filament are connected by a coil of wire, and the plate and filament are connected by what is called a tuned circuit consisting of another coil with a condenser across its terminals. In this tuned circuit we get a great readiness for electric current to be generated at a given frequency. A slight disturbance in this circuit reacts in the coil in the grid filament circuit, causing an alternating voltage between filament and grid, thus causing a large alternating flow between plate and filament, and hence the tuned circuit above referred to responds easily to this; oscillatory current in the latter is thus built up to a high value, and can then be used to operate a telephone and produce a sound. For demonstration of this a loud speaking telephone can be used.

The tuned circuit already referred to can have its note altered by altering the condenser. So a range of notes can be obtained from 300 per second (G above middle C of the piano) to some very high pitch only just distinguishable.

It would not be difficult to produce similar apparatus for getting the upper limit of audition, but in this case it is difficult to get a pure note over so high a range.

By altering the glow of the filament we can alter the loudness of the note, so that the instrument is well under control. But if we keep the filament at a steady glow, we do not get the same amount of oscillatory current for all pitches. We can, however, level out this curve by altering the filament glow.

We thus have our oscillatory electric current. We now pass the current into a Wheatstone bridge circuit in order to reduce it to a value suitable to our requirements. The telephone used for the signal is the usual wireless head telephone, with two receivers, and one of these is disconnected, so that the sound only enters one ear, while the other is blocked up, and so is protected from disturbing noises. When the bridge is in balance, there is no current in the telephone and no sound. We alter the fourth arm of the bridge from its balance value of 1000 ohms resistance to 10,000, and the more we throw it out of balance the louder is the sound.

When the subject is being tested he sits down with closed eyes, and he places one hand on the table. Then the signal is put in the telephone by means of a silent key, and if the subject hears he raises his finger, lowering it when the sound ceases. We then reduce the sound till the finger just fails to respond to the signal, and the acuity value is read off on the scale.

The apparatus, however, will do more than this. An arrangement is made by means of which a disturbing sound of any desired pitch or intensity is maintained in the signal telephone, and the signal is transmitted as before. A new reading is thus obtained. In this way paracusis is tested and compared between different individuals and for different ears.

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With regard to the standardising of the sound, an instrument is inserted in the current generator for measuring the current output, and a definite value for this current is laid down, so that the same sound can be reproduced day after day.

Further, if the telephone has to be replaced by another, a method has been devised for comparing it with the one previously used, and, furthermore, apparatus has been devised and is now being perfected for measuring the sound in absolute units of energy, so that ultimately we hope to derive a measure of that energy which is just capable of affecting the ear of any subject—either deaf or of acute hearing—and of showing how this alters with age or with varying physical condition.

Mr SOMERVILLE HASTINGS said that the results obtained by the apparatus had been extraordinarily constant.

Qualitatively they agreed with the results obtained by other methods. If a person heard better with one ear by tuning fork, voice, and the acoumeter, he will hear better with the same ear by Major Tucker's apparatus. Quantitatively the tests differed according to the type of deafness, as we should expect.

We have made a good many observations on the effect on the same ear or opposite ear, of a loud disturbing sound. We have found that in all types of deafness examined, a disturbing sound in the opposite ear makes hardly any difference in the power of hearing in the one being tested. If, however, the disturbing sound is in the same ear, the intensity of the signal has to be increased some seventeen to twenty-four times, before it is appreciated in the case of a person with normal hearing. Cases of internal ear deafness and those with perforation of the membrana tympani required eight or nine times the usual stimulus.

In chronic catarrhal deafness we have found that most patients need an increase in the intensity of sound about nine or ten times, before it is perceived, and one or two who had never noticed that they heard better in a noise needed an increase of about five times. In the case of patients with paracusis who were well aware they could hear better in a noise, only from 1.7 to 2.3 times the stimulus was required. We have never yet found an individual who could really hear "better in a noise."

Dr WILLIAM HILL considered that the instrument would be very valuable, and the exhibitors were to be congratulated on the clear exposition they had given. He supposed that in perfecting the instrument for the use of the profession it could be made fool-proof.

Dr LOGAN TURNER said he understood that when the buzzer was placed against one ear, the hearing in the other ear was not diminished. When experimenting with Bárány's noise apparatus on a normally hearing individual, he had found the hearing in the non-obstructed ear was slightly reduced from the normal. The apparatus now demonstrated possessed an advantage.

Mr G. J. JENKINS also congratulated the exhibitors on this valuable piece of work; it had been the want of otologists for many years, and many had tried to establish some such standard. He had himself tried to do so by means of an induction coil, getting a variation of intensity

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of sound by separating the two coils ; but he found he could not produce, by a mechanical apparatus, a make and break sufficiently rapid to give more than 4000 to 5000 vibrations per second. He therefore turned his attention to the valve referred to. A friend of his had been working at such apparatus in Edinburgh for some time, but had given it up a short while ago, after hearing that work on these lines was being done in America. There was no doubt that the present apparatus did give a new test for hearing, and it would be advisable that the Section should take an active interest in the matter, and help the workers to arrive at a complete standardisation. He asked the probable cost of the apparatus. It would not take the place of tuning forks entirely.

Mr SYDNEY SCOTT also expressed his interest in these investigations, which taken into consideration with those carried out in America by Dr Gordon Wilson and others, would yield important new data in elucidating problems of hearing.

Mr SOMERVILLE HASTINGS (in reply) agreed that the action of the buzzer in one ear did not depreciate the hearing in the other ear. The padding of the ear-pieces prevented any but the slightest bone conduction. The estimations were in terms of energy. The normal was the average of a number of people with good acuity.

Major TUCKER (in reply) said that an instrument for medical testing could probably be produced for £15 or £20. Listeners when employed for anti-aircraft work had to come up to a certain standard which was based on an average of apparently normal hearers. The instrument had shown great diversity in hearing between people supposed to be normal. Subjects were also tested to see whether their ears were of equal value—a matter of great importance in anti-aircraft work.

**A Temporal Bone from a Case of Tuberculous Lateral Sinus Thrombosis and Extra-cerebellar Abscess—E. D. D. DAVIS, F.R.C.S.**—A barman, aged 37, was admitted to the medical ward on 9th February 1922 with temperature 103° F., respiration 36, pulse 116. Consolidation of whole lower lobe of left lung. Rusty sputum pronounced and repeated vomiting of three days' duration. Diagnosis, pneumonia. Temperature subsided by crisis on seventh day and chest signs disappeared. Patient intelligent and not drowsy. No history of a rigor, but complained of occipital headache. Sputum : no T.B. found. Patient sent to convalescent home, and returned a few days later, on 23rd March, complaining of headache and vomiting. Temperature 101.4° F.

31st March—First examination of ear and nose. Suppuration of right middle ear of long duration. Granulation tissue polyp occupying posterior superior wall. Neither mastoid tenderness nor œdema. Hearing : voice, 2 ft. ; bone conduction normal. Slight nystagmus on looking to right increased by irrigation with hot lotion. Pupils equal and reacting : optic discs with outline blurred ; frontal headache ; patient drowsy and slow, with occasional vomiting. Stiffness of neck.

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Deep reflexes increased. No paralysis. Mastoid suppuration with possible posterior fossa abscess diagnosed. Operation strongly advised, but refused. Cerebro-spinal fluid: increase in cells 61 per c.m., chiefly lymphocytes. Albumin: 2 per cent. excess of globulin. Wassermann reaction negative. Patient became unconscious and died suddenly on 24th April.

*Post-mortem*—Cortex and its meninges normal. An abscess containing about 2 drachms of pus was found on the surface of the right cerebellar hemisphere, forming a slight cavity within the hemisphere and surrounding the right lateral sinus. The dura, over an area corresponding to a five-shilling piece extending from the tentorium to the foramen magnum, was covered by pale granulation tissue, and a number of small white tubercles could be seen on the inner surface of the dura. The temporal bone was extensively necrosed in front of the lateral sinus groove, and a sinus led outwards into an abscess in the mastoid process. The lateral sinus was replaced by granulation tissue and showed old thrombosis. The cerebellum was otherwise normal. No tubercles were seen in the sylvian fissures or on the cortex. Chronic suppuration of right middle ear with polyp on posterior superior wall. Mastoid full of pale granulation tissue and pus. A large sinus, in lateral sinus groove, extending into the abscess in the posterior fossa. The outer mastoid plate of bone was perforated in the suprameatal triangle, but there was no subperiosteal abscess. The mastoid antrum was full of granulation tissue, but most of the bone disease surrounded the lateral sinus. Sections of the granulation tissue and dura mater were stated to be tuberculous. Lungs: broncho-pneumonia, old tuberculous foci and pleuritic adhesions. Nothing to suggest infarction such as is seen in lateral sinus thrombosis.

Mr SYDNEY SCOTT said that he believed cases such as Mr Davis described must be rare. Hitherto he knew of only one recorded case of tuberculosis of the lateral sinus. This was published in the *Proceedings of the Royal Society of Medicine*, 1916-17 (Section of Otology), p. 84. He had shown the histological preparations demonstrating tuberculosis in the lateral sinus, the contents of which were removed when the child was about five years of age. She was now thirteen years old, and her father, a well-known medical man, said she was in perfect health.

**Case of Acute Suppuration in one Ear subjected to Early Operation on Account of Complete Deafness of Opposite Ear**  
—Sir JAMES DUNDAS-GRANT, K.B.E., M.D.—A middle-aged man, with complete deafness in the left ear, radical mastoid operation and precedent facial paralysis, developed acute suppuration in his right middle ear, and for the moment was practically quite deaf. In view of the serious possibility of permanent total deafness if by mischance the right ear failed to recover, Schwartz's operation was performed a

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little more than a week after the onset, in spite of the absence of "mastoid" signs, in order to leave nothing to chance. The wound was closed, excepting a small opening at the lower part through which a strip of the gauze plugging passed. When this was removed a small drainage tube was inserted. Very rapid subsidence of the discharge, and healing of the perforation with restoration of hearing followed.

Complete deafness of the opposite ear is an indication for expedition in performing the simple mastoid operation, though, in general, a contra-indication for the radical operation.

Dr WILLIAM HILL said the case raised a very important point, namely, whether by operation middle-ear suppuration could not have its course shortened. He had never regretted operating on such cases, though he had had occasion to regret having put off operation. The Schwartz method was an operation there was no need to hesitate about doing ; it was a simple and easy procedure. A year ago he had had a case in which the whole discharge ceased three days after Schwartz's operation had been done. At the same time he slit up the roof of the meatus, and there was no further suppuration, neither was there any subsequent swelling. Mr Heath advised operating in these cases, and he called his particular operation a conservative one. His (Dr Hill's) view, however, was that it was far from being conservative, for in many of the cases dealt with by Mr Heath it was an unnecessarily destructive proceeding. There were no complications following Schwartz's operation, and it was well worth while to consider whether doing such might not prevent the development of more serious symptoms.

Mr H. J. BANKS-DAVIS said that after a Schwartz operation there was the possibility of the post-aural mastoid wound not closing, with a resulting visible fistula. This could never occur if the post-aural wound was closed and meatal drainage was employed as in the "Heath operation," where any continuance of the aural discharge could be more easily dealt with by the patient than if the discharge exuded from behind the ear. In women seeking employment this was often a serious disadvantage and a great disfigurement ; closing these fistulæ was not always an easy matter.

Dr LOGAN TURNER said that the present-day tendency was to operate earlier than formerly in acute middle-ear suppuration. He preferred the Schwartz operation to the so-called Heath method as he believed that better drainage was obtained by Schwartz's operation.

Sir JAMES DUNDAS-GRANT (in reply) said that as this was the man's only effective ear, he worked for safety, rather than risk the possibility of total deafness. If the other ear had been fairly good, he would have left it. In answer to Mr Banks-Davis as to the risk of a fistula persisting behind the ear, when that occurred, it was an indication that the operation was all the more called for. If the disease settled down, the fistula could be remedied by a plastic operation.

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**Material Improvement in Old Specific Deafness**—RICHARD LAKE, F.R.C.S.—Male, aged 38. Fourteen years ago specific history, injections of some antispecific remedy. Right ear totally deaf. November 1906: severe vertigo with bilateral deafness. Tried "Harvey's" treatment; a little improvement. Wassermann just positive. Treatment: hectine A, hectine B; hectagyre A, three injections per week with an interval between each set of injections (ten in each series). He is now having hectagyre B.

**Case of Absolute Bilateral Deafness, with almost Complete Loss of Vestibular Activity**—ARCHER RYLAND, F.R.C.S.Ed.—G. C., male, aged 30. First seen 10th October 1922. He joined the Army in 1914, and deafness was not noted at that time. The deafness has come on since that date and is due to congenital syphilis. The loss of hearing is complete, and, as far as investigation has at present gone, the loss of vestibular activity is apparently complete except for a very slight response on the part of the left labyrinth.

The following points may be noted:—

- (1) The voice is quite uncontrolled. The cochleo-palpebral, and Lombard voice-raising tests are negative.
- (2) Wassermann: strong positive, + +.
- (3) Eyes: corneal nebulae; pupils unequal; left iritic margin irregular; "patches of retinitis at periphery" have been reported by oculist.
- (4) Teeth: upper incisors Hutchinsonian in character.

Sir JAMES DUNDAS-GRANT said he had seen slight degrees of improvement taking place under increasing doses of arsenic combined with mercury—Donovan's solution in fact—even in congenital or hereditary specific disease, though there was not much restoration of hearing. The general condition, in regard to giddiness, etc., had been improved.

Mr ARCHER RYLAND (in reply) said that the investigation of the case was at present incomplete as he had not had an opportunity of fully recording the nature of the vestibular reactions. There was no mistaking the nature of the congenital defects, and the Wassermann test was strongly positive. The point of interest of course was the manner of invasion of the labyrinth and internal ear. The tympanic membranes on each side were scarred, and this pointed to an obsolete suppurative middle-ear condition. This was probably an illustration of a type of case, held by J. S. Fraser and others to be not infrequent in occurrence, in which the original middle-ear infection was syphilitic (though, later, probably polymicrobial) slowly invading the petrous, and attacking the labyrinthine capsule, giving rise to a chronic form of osteomyelitis which slowly invaded the perilymph space of the labyrinth. There had been no history of sudden attack on the labyrinth, but of a gradual progress to absolute deafness and loss of vestibular function.

## Nose

**Tinnitus associated with Facial Spasm**—G. J. JENKINS, F.R.C.S.—Female, aged 53. Spasm of left facial nerve, one year five months. Tinnitus began with onset of the spasm. A single twitch of the muscles was associated with a synchronous noise in the left ear. Patient described the noise as a “bang.” When twitches followed one another rapidly the noise was like the “popping of a motor car.” When twitches were very rapid the noise became continuous and sometimes bell-like. There was pain in the left ear at the onset of the disease when the twitching was very bad. Post-suppurative effects in the right ear. Tympanic membrane on left side showed opacities.

Sir JAMES DUNDAS-GRANT said he thought the murmur was perhaps a muscular one caused by the contraction of the stapedius, associated with contraction of the facial muscles. If the normal subject closed the ears and then shut the eyes tightly, a deep-toned hum was perceptible. Mr Jenkins' patient said that the sound she was hearing was the same as that which followed the energetic shutting of the eyes in the way mentioned.

Mr SYDNEY SCOTT said he had seen some similar cases at Queen Square, but was unable to throw light on the pathology. He believed the subjective noise might be caused by the repeated contractions of the stapedius, because in some cases the patient felt momentarily giddy during the attacks of twitching of the face. This patient said she was not giddy, but she was deaf in the opposite ear.

Mr G. J. JENKINS (in reply) said he had shown the case because it seemed to be one in which a specific cause for the tinnitus could be made out. There was a spasm of the left seventh cranial nerve. The tinnitus might possibly be due to the sound produced by the contraction of the facial muscles being conducted to the ear, or by a movement of the pinna, but he thought it was due to the movement of the stapes produced by the contraction of the stapedius muscle. As to whether the tinnitus was due to the simple movement of the stapes or a vibration set up in the tympanic membrane and ossicles it was difficult to say, but he thought it was more likely to be due to movement of the stapes itself.

## ABSTRACTS

### NOSE.

*External Nasal Deformities: Description of the Operative Technic of a New Method for the Correction of Certain Types.* Dr J. D. LEWIS. (*Laryngoscope*, Vol. xxxii., No. 3, p. 214.)

It is proposed under local anæsthesia to make an incision half an inch long in the mid-line of the lower half of the columella nasi. The edges are undermined laterally and towards the tip of the nose, so that the latter is raised to enable scissors to cut towards the

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nasal bones and thus form a pocket for the transplant. The tip should be undercut about an eighth of an inch beneath the skin. It forms a hood and provides a support inferiorly for the lower end of the graft.

ANDREW CAMPBELL.

*Rhinolithiasis.* H. KEY-ABERG. (*Acta Oto-Laryngologica*, Vol. iii., fasc. 4.)

This is a comprehensive discussion of the etiology, chemical composition, and symptomatology of rhinoliths, together with statistics of cases published in Sweden. Attention is drawn to the predilection of rhinoliths for the female sex, *i.e.*, 70 per cent. of the cases. A detailed account is given of the various foreign bodies which have been found to form the nuclei around which the salts have been deposited. As regards the chemical composition, phosphate of calcium is always and the carbonate usually present: magnesium is found only occasionally, and chlorine was met with once. In one case the author found more than 15 per cent. of iron, the largest quantity discovered in a rhinolith apart from a case described by Jörgen Möller in which more than a third of the total substance consisted of oxide of iron.

Although the prognosis in these cases is usually so favourable, the author gives details of a case which resulted in death from septicæmia, set up by accessory sinus infection due to the presence of a rhinolith. In this case and in one other observed by the author a rhinolith was accompanied by empyema of the maxillary antrum, an association met with in only six previous cases.

THOMAS GUTHRIE.

*The Use of Submucous Injections of White Vaseline in the Treatment of Ozæna.* C. CALDERA. (*Arch. Ital. di Otol.*, Vol. xxxiii., 1922.)

Caldera has used submucous injections of paraffin in ozæna for about ten years, and has found it on the whole very satisfactory. Some cases give unexpectedly good results, and at the worst some improvement is to be expected. The use of melted paraffin is dangerous on account of the risk of embolism. Hard paraffin, again, has the drawback of being very liable to cause rupture of the thin mucosa. In the last few years Caldera has been using ordinary white vaseline instead of hard paraffin. The vaseline is kept in glass tubes which fit the bore of the syringe accurately, and is sterilised in an autoclave. An ordinary paraffin syringe with a screw piston is used. By the use of vaseline the danger of rupturing the mucosa is greatly lessened, and the same beneficial results are to be expected as with hard paraffin. Before using this method a preliminary course of treatment of five to six months' duration is



## Nose

necessary in order to get satisfactory results. This consists of thorough lavage followed by the application of irritating solutions, such as 1-5 per cent. silver nitrate, with the idea of toughening the mucosa. If this is not done failure is apt to result. J. K. MILNE DICKIE.

### *Nasal Obstruction in Infants during the First Year of Life.*

J. ARNOLD JONES. (*Lancet*, Vol. ii., p. 327, 1922.)

A very useful paper, classifying causes into:—1, Congenital occlusion of (a) anterior nares, (b) posterior nares; 2, temporary presence of mucus with engorgement of nasal mucosa; 3, congenital syphilis; 4, mongolism; 5, adenoids. In adenoids, operation without anæsthetic is advised, and the author gives his results.

MACLEOD YEARSLEY.

### *A New Local Hæmostatic.* PUGNAT, Geneva. (*L'Oto-Rhino-Laryngologie Internationale*, April 1922.)

The problem of hæmostasis in rhinology has not yet been properly dealt with. It is true that during operation a bloodless field can usually be procured, but so far, packing is the only effective means of preventing post-operative bleeding. Taking advantage of the coagulating powers possessed by aqueous extracts of the body organs, Pognat has made use of lung extract in the form of a very finely divided powder.

To prove the power of the extract, it was used first in turbinotomy cases where the anæsthetic employed was alypine, a vase-dilator. Application of the powder at once stopped the hæmorrhage. The extract was then used in cases where cocaine and adrenalin had been used, and in no case of those treated in this way had there been post-operative hæmorrhage.

Pognat states that the extract is useless in persons where for any reason the coagulative time of the blood is not within normal limits.

GAVIN YOUNG.

### *Antro-choanal Polypus of Exceptional Size.* G. W. DAWSON. (*Lancet*, Vol. i., p. 1095, 1922.)

Case of an antro-choanal polypus, weighing  $9\frac{1}{2}$  drachms, in a man, aged 47. The patient could breathe well through either nostril, his only symptoms being muffled speech and occasional fits of suffocation. The growth was removed by opening the antrum through the canine fossa and detaching the polypus at its origin.

MACLEOD YEARSLEY.

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## PERORAL ENDOSCOPY.

*Pharyngeal Diverticulum and its Surgical Treatment, with a Record of Two Cases.* D. P. D. WILKIE and J. N. J. HARTLEY, Edinburgh.  
(*British Journal of Surgery*, Nov. 1922.)

Killian has shown that the condition is due to a protrusion of mucosa between the transverse and oblique fibres of the cricopharyngeus muscle in the mid-line posteriorly.

The wall of the sac consists of stratified epithelial lining, and some loose muscle fibre round the neck, and the main and outermost coat is formed from the pharyngeal fascia.

Two etiological factors are involved—one a weakness of the wall, and the other increased intrapharyngeal pressure, probably due to irregularities in action of the sphincter at the entrance of the oesophagus, and in most cases the primary cause would appear to be the inco-ordinate action between the propulsive and sphincteric elements of the pharyngeal muscle. Treatment must be directed to removal of the cause as well as to extirpation of the sac.

Numerous methods of removal of the diverticulum are described, and on the whole a two-stage operation is advocated for the majority of cases, in order to avoid the risk of cellulitis extending to the mediastinum. In this type of operation the sac is freed from its surroundings and carefully packed round and the skin sutured down to its neck; later, the sac itself is excised. In the case of a small sac it can be excised at one operation.

It is interesting to note that the condition occurs most frequently in men past middle life.

E. MUSGRAVE WOODMAN.

*Retro-Oesophageal Abscess.* JEAN GUISEZ. (*La Presse Médicale*, 29th April 1922.)

Three cases in children are described. It is a condition met only in young children, and due to a scratch or prick by a fish bone or similar object. The site of the abscess is behind the posterior wall of the gullet and mainly opposite the sixth and seventh cervical vertebræ. Its development is slow, and in the later stages dysphagia and dyspnoea are features; the dyspnoea may be urgent enough to require a low tracheotomy, and is due to a flattening of the trachea from pressure. Diagnosis depends on inspection by direct oesophagoscopy, and the treatment adopted, which in each case was perfectly successful, was firstly, a low tracheotomy, and secondly, the opening of the abscess by means of cutting forceps and a suitable oesophagoscope. The differential diagnosis must be made from that of a foreign body in the trachea.

F. J. CLEMINSON.

# Peroral Endoscopy

*Cicatricial Stenosis of the Œsophagus.* L. LEDOUX (Brussels).  
(*L'Oto-Rhino-Laryngologie Internationale*, June 1922.)

1. Emphasis is laid on the peri-œsophageal inflammatory changes which are frequently present in cases of this condition. The pleura is not uncommonly involved, and three cases are related in which a right pleural effusion followed dilatation of the stricture. In each case effusion cleared up spontaneously within a few days.

2. Certain cases of stricture are found to resist dilatation and to contract rapidly down again when it has been effected. This is probably due to traction and kinking of the œsophagus by pleural adhesions or the fibrosis of glands in the hilus of the lung. Severe strictures are most usually situated at the broncho-aortic isthmus where the pleura is intimately related to the œsophagus.

3. The formation of complete stenosis is difficult to explain. In three cases no bismuth could be seen to pass, and no passage could be made out with the œsophagoscope. The continual passage of food and secretions and the communicated movements from heart and lungs should prevent an absolute stenosis. Final closure is a secondary effect, due partly to the contraction of the cicatrix and partly to the ulceration of its edges.

4. The broncho-aortic region is the most common site for a stricture. Factors which determine the seat of delay of the corrosive fluid, and therefore the site of the stricture, are: The attitude of the individual when the fluid is drunk, the concentration of the fluid, and the resulting presence or absence of spasm of the sphincter.

5. The lateral position is the most suitable for œsophagoscopy as it facilitates the emptying of secretions. Application of adrenalin is useful to assist in finding the opening of the stricture.

6. Radiography gives the most exact information as to the extent of the stricture. With a normal œsophagus, the passage of fluid bismuth is too rapid to be observed on a plate or screen. In any case in which a stricture is present, however short, the bismuth shadow below the stricture will be filiform, the fluid passing through in a fine stream. This appearance is sometimes interpreted as showing a stricture of considerable length, but probably single and uniform strictures are never of a greater length than 5 or 6 cm.

7. In cases of multiple strictures, the dilatations tend to have the form of a pear with the stem pointing upwards. This would seem to favour the employment of retrograde dilatation, but the fact that there are usually bands and irregularities in the œsophageal wall above the stricture frequently outweighs this theoretical advantage.

A. J. WRIGHT.

## Abstracts

*The Liver Tunnel and Cardiospasm.* H. P. MOSHER, Boston.  
(*Laryngoscope*, Vol. xxxii., No. 5, p. 348.)

In a previous paper the author demonstrated that the liver was responsible for the shape of the lower end of the œsophagus. The lower end is cone or trumpet-shaped; it has liver to the right, in front, and in many cases to the left; behind, it has the descending aorta. Thus a "liver tunnel" is formed for the subdiaphragmatic œsophagus. When a normal patient swallows Barium milk the œsophagus comes to a point at the upper edge of the liver, then after a delay of a second or two the tunnel opens up and the milk streams into the stomach, as the diaphragm is lowered. Experiments on the cadaver show that lowering of the diaphragm opens up the tunnel. There must be some correlation or rhythm between the peristaltic movements of the œsophagus and the relaxations and contractions of the diaphragm.

In cardiospasm the diaphragm is usually lowered and its downward excursions are small, though its upward excursions are normal. The lowering closes the œsophagus and the raising opens it up, the reverse of what normally happens.

In reviewing 10 cases of cardiospasm a stricture was found in all, varying from a crescentic fold to a full annular stricture. In 1 case the whole tunnel was narrowed. In all these strictures there may be an element of spasm, which reinforces the obstruction, but the spasm is a minor consideration. The cause of the annular stricture is probably due to some previous infection of the lesser omentum. Cases are cited in support of this view. The paper is well illustrated by the author himself.

ANDREW CAMPBELL.

*The Bronchial Tree: Its Study by Insufflation of Opaque Substances in the Living.* Dr CHEVALIER JACKSON. (*American Journal of Röntgenology*, Vol. v., p. 454.)

The author in a number of cases deposited a small amount of bismuth in the bronchi for aid in localisation of foreign bodies and also in bronchiectatic and abscess cavities. In none of these cases were there any after-effects.

In a young man, aged 23, with a metallic F.B. "around the corner" in an ascending branch of the left upper-lobe bronchus, bismuth subcarbonate was blown in with an insufflator. A radiogram showed the main bronchus, upper-lobe bronchus, and some of the branches. The foreign body was removed. In twenty-four hours a radiograph showed that all the bismuth had disappeared from the lungs. There was occasional cough and expectoration was free, the sputum being milky white.

By means of insufflation and stereoscopic X-ray pictures the

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tracheo-bronchial tree can be shown up *in situ*. This is of great value in upper-lobe bronchus cases. Injection of opaque fluid or insufflation of powders through the larynx gives a degree of visibility to the trachea and larger bronchi, but the best results are obtained by insufflation through the bronchoscope. The method opens up a field for investigation of the action of the cilia, lymphatic drainage of the lung, mapping out of bronchiectatic cavities, etc.

ANDREW CAMPBELL.

*A Case of Lung Stone removed by Bronchoscopy.* H. BURGER.  
(*Acta Oto-Laryngologica*, Vol. iv., fasc. 1.)

The patient, a female, 43 years of age, had always enjoyed good health until six months before she came under observation, when she began to suffer from an acute burning pain in the chest, which was followed three months later by fits of coughing, asthma, and shortness of breath.

Bronchoscopy showed the left main bronchus to be almost completely blocked at a point 5 cm. below the bifurcation by a pale red swelling arising from the median wall. The swelling was smooth and firm and a bougie could not be passed beyond it. The appearances were those of compression of the bronchus by a tumour of the lung.

On examination, six weeks later, the swelling was found to be soft and dark red in colour, with a tendency to bleed. It presented a little depression with a white base, and from this situation the author removed with forceps a carbonate of lime calculus measuring  $9 \times 5 \times 4$  mm. and weighing 185 mgr. The removal of the stone was followed by almost immediate relief and all symptoms gradually disappeared.

This is the first case in which the various stages of the perforation of the wall of a bronchus by a pneumolith have been observed, and in which bronchoscopy has rendered possible the removal of the stone.

THOMAS GUTHRIE.

## REVIEWS OF BOOKS

*Smell, Taste and Allied Senses in the Vertebrates.* G. H. PARKER, Sc.D., Professor of Zoology, Harvard University. Illustrated. Philadelphia and London: J. B. Lippincott Company, 1922. Price 10s. 6d. net.

Within its limits, imposed no doubt by the editor of the series to which it belongs, this small book of 200 pages supplies in a conveniently arranged manner much of the anatomy and most of the physiology of the senses of smell and taste in man and in the other vertebrates. In form it is compact, and in diction severely

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scientific; nevertheless, it is quite readable; and this, in the circumstances, is high praise.

In discussing the problem of olfaction, Professor Parker manifests caution; perhaps too much caution. Otherwise he might have questioned seriously the classical view that the materials which act on the olfactory cells do so chemically. As it is, he does not seem ever to have asked himself exactly what is meant by "chemical" action in the olfactory area. He shows no knowledge, to be sure, of the work and theories of Heyninx, reviewed in 1921 in this *Journal*, with their surprising conclusion that it is by means of ultra-violet rays that the olfactory sense is activated. Heyninx's arguments may be strained and his views far-fetched, but they have at least this merit that they lead us to enquire what the term "chemical" means in this connection, with the result that we discover that it means nothing at all; it is merely a cloak for our ignorance. To mention one point only; the independence shown by substances giving off similar odours of any common chemical combination or similar molecular structure is surely sufficient to dispose of the "chemical" theory.

This consideration emboldens us to go a step further in our criticism. As the book now being reviewed reminds us, dealing as it does, in one short volume, with both smell and taste (to say nothing of "the common chemical sense") the popular assumption is that these two are closely related and that they belong indeed to one type of sense organ. But do they so belong? Both, we admit, are called "chemical" senses, but that, as we have just seen, is merely a begging of the question. Both also, though only to a certain extent, combine in serving the same ends, namely, feeding and digestion. On the other hand, if their functions are akin and their mode of being stimulated similar, how is it that their structure shows so great a difference? For they differ greatly, not only in their histological formation, as we all know, but also, as Professor Parker clearly and distinctly states, in the nature of their nerve organisation. In the organ of olfaction, as in that of vision, the neurone of the sense is actually the sense-epithelium, while the neurone of the organ of taste lies remote from the sense-epithelium. That is to say, that the neurone of smell is exposed to the direct action of the stimulus, while the neurone of taste is not so exposed, and can only be acted upon indirectly. These striking facts are sufficient, we suggest, to lead us to doubt the propriety of coupling together the senses of taste and smell as if they were merely modifications of one another.

In addition to the absence of any reference to Heyninx's theories, we must also remark that the reflex reactions both of smell and of taste, but particularly of smell, are inadequately described, while there is an entire omission of the comparative anatomy of the olfactory lobes of the brain. Indeed, an allusion, all too brief, to the

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occurrence of cells like the olfactory cells of vertebrates in the integument of the sea-anemone, as suggesting the early appearance of the sense of olfaction in animal life, makes us regret that the author did not confine his attention to smell alone and give us an account of its presence in invertebrates as well as in vertebrates. Readers of Fabre's books will remember how interesting were the experiments and conclusions of that remarkable observer on the subject of olfaction, among the insects.

In spite of its defects, however, this book is well worth reading, and many of its details are novel and arresting. Anglers may perhaps be surprised to learn that taste-bulbs are known to occur on the integument of many species of fish. They are supplied by an extension of the seventh cranial nerve.

DAN M'KENZIE.

*A Handbook of Aural Surgery for Students and Practitioners.* WILLIAM WILSON. Pp. 336. Manchester: SHERRATT & HUGHES. 1922.

The aim of the author in writing this book has been "to present to the overburdened student and the busy practitioner a concise and comprehensive outline of modern Otology." "Academic theories and vague discussions of alternative treatment" have therefore been excluded, and "the subject matter is purposely arranged for ready reference," while "an endeavour has been made to give definite and explicit information as to diagnosis and treatment."

It may be said at once that the author has achieved his object, and has produced a trustworthy guide for the "busy practitioner" as well as for the senior student preparing for his final examination. The book bears, throughout, the evidence of being founded on the writer's personal experience, and although his views as to pathology and methods of treatment cannot, in the nature of things, always meet with universal acceptance, most otologists will find in the book little cause for serious disagreement. While, therefore, the work is not, and does not claim to be, a scientific treatise on Otology, and is almost completely devoid of references to the literature and of any consideration of alternative points of view, it may be confidently recommended to those for whom it is intended.

The first thirty-three pages are devoted to the surgical anatomy, and are followed by a very brief reference to the physiology of the middle ear. No account is given of the theories of audition, but the static function of the labyrinth is dealt with later in connection with the pathology of this portion of the organ. There follow sections on the methods of examination and on disease of the external ear and meatus. The meatal ear-syringe is condemned in favour of a Higginson syringe with fine nozzle. In furunculosis, insertion of gauze, soaked in a solution of picric acid followed by hot fomentations, is preferred to incision.

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Middle ear catarrh, which next claims attention, is classified as (1) Acute catarrhal otitis media, which does not include the condition of exudation following Eustachian obstruction, in which the fluid is sterile; (2*a*) chronic parenchymatous catarrhal otitis media in which the chief change is one of hypertrophy of the mucous membrane with free secretion of mucus; and (2*b*) chronic interstitial catarrhal otitis media in which hypertrophy of tissue is followed by contraction and atrophy.

Acute suppurative otitis media is divided into the two groups of (1) primary catarrhal and secondary suppurative, and (2) primary suppurative—a distinction which seems hardly necessary, in view of the fact that the “catarrhal” stages are admittedly present in both varieties though very transitory in the second. After the occurrence of perforation and the subsidence of pain “politzerisation should be commenced, but not employed very frequently. It does no harm by spreading infection, as has been suggested, but prevents post-suppurative adhesions.” The author has given zinc ionisation a fair trial, and has found it inferior to other methods.

The indications for mastoid operation in chronic aural suppuration are clearly stated, and the advice is added never to “operate simply and solely to stop a slight discharge, since (*a*) operation may fail, even in the most skilful hands, to stop discharge; (*b*) occasionally operation stirs up sepsis, as by precipitating labyrinthitis or sinus thrombosis, or merely renders the discharge worse by opening up fresh bone.”

The conservative mastoid operation is favoured in suitable cases, particularly those of attic perforation with or without cholesteatoma. In these it must include removal of the outer wall of the attic.

In cases of suspected lateral sinus disease the author always obliterates the sinus (whatever its apparent condition) and ties the jugular vein, if a blood examination, previously made, shows the presence of infection, and especially if the temperature reaches 103.5 or more.

Thirty-five pages are devoted to diseases of the labyrinth and their diagnosis and treatment, short descriptions being given of all the principal operations. The vestibular reactions and indications for operation are clearly described.

After two short sections on tumours and injuries, four pages are devoted to otosclerosis, which is regarded as an “entirely labyrinthine” disease and “totally independent of any disease in the middle ear.” Particular stress is laid on the absence of any signs of inflammation, and no reference is made to the views of Fraser and others in this connection. “That it is dependent upon lowered nutrition and diminished nervous tone is practically all we know of its causation.”

There follow several short sections on such subjects as “The Ear in Systemic Disease,” “Malingering,” “Deaf-mutism,” and “Facial



## Letters to the Editors

Paralysis." In reference to the latter it is stated that "imperfect closure of the eyes causes epiphora, conjunctivitis, corneal ulceration and *atrophic rhinitis* on the same side."

The book terminates with brief epitomes of seventeen cases—mainly examples of the intracranial complications of ear disease which should prove very useful to the student.

The illustrations number 100, and, excepting those of instruments, have all been drawn by the author. They are simple, diagrammatic, and for the most part adequate, although some, especially in the anatomical section, would be improved by the introduction of a little more shading to indicate differences of level. There is a good index.

THOMAS GUTHRIE.

## LETTERS TO THE EDITORS

TO THE EDITORS,

*The Journal of Laryngology.*

SIRS,—In his letter regarding the "Blood-Clot Method of Closing the Mastoid" in the November (1922) issue of your *Journal*, I notice that Mr Tilley states that he regards two "indispensable factors" as necessary to obtain a successful result, and that one of those indispensable factors is "the complete removal of all infected areas."

I am wondering whether Mr Tilley has not forgotten one rather important infected area, the complete removal of which would, I fear, present some little difficulty, and the retention of which must (one would think) prejudice the asepticity of the closed mastoid wound. I refer of course to the middle ear.

It is true that experiment and experience, not logic, are what rules the surgeon's practice, and were this point merely one of debating value I should have let it pass. But my experience with early mastoid operations, as well as with the ordinary operation for manifest mastoid suppuration, has led me to practise and to teach that it is safer, and at the same time free from any drawback, to drain the mastoid wound, and with it the middle ear, for several days at least after operation.

DAN M'KENZIE.

LONDON.

THE EDITORS,

*The Journal of Laryngology.*

SIRS,—I observe a letter from Mr MacGibbon in the October number of the *Journal* (1922) re "The Blood Clot Method of Closing the Mastoid," and take it that this is in the nature of a reply to Mr H. Tilley's letter which appeared in May, where my

## Letters to the Editors

name was mentioned as having carried out the method fairly extensively; it is only in justice to Mr Tilley that I should give my experience.

I have performed approximately 400 operations for acute and subacute mastoiditis by the blood clot method. Previous to March 1919, when Mr Tilley's modified method appeared in the *Journal*, I had carried out the original blood clot method on 100 of the 400 cases, *i.e.*, flushing the wound with normal saline, allowing the cavity to fill with blood, and primarily stitching without drainage. I regret to say that this in my hands was an entire failure as only 25 per cent. healed with dry ears, etc.; the remaining 75 per cent. became inflamed and broke down, requiring reopening with subsequent drainage. Still the patient was in no worse a position than if the cavity had been primarily packed and drained.

Since March 1919, in all acute and subacute mastoiditis, both in hospital and private practice (most of my private work is done in hospital), I have carried out Mr Tilley's modified method, that is, flushing the cavity with saline, alcohol, B.I.P., and finally allowing the entire cavity to fill with blood and stitching the wound completely; the results have been excellent. Out of 300 cases, in 95 per cent. ten days was the average stay in hospital; the middle ear became dry and hearing returned to normal; of these 95 per cent. 60 per cent. could have left the hospital on the eighth day, but acting on Mr Hunter Tod's valuable experience that should sinus thrombosis occur as the result of traumatism, it invariably occurs not later than the tenth day, and in these acute cases of mastoiditis, 50 per cent. at least have their sinus exposed, so that the tenth day was precautionary; the remaining 5 per cent. showed redness of the wound with serous discharge at the lower extremity requiring reopening to the extent of 1 mm.; these cases were rapidly put right by the application of dry heat (the electric box); in only one was there free suppuration which recovered with the usual three weeks' packing.

The exposure of dura mater and the sinus does not in the least interfere with primary closure.

Out of the 400 cases 5 were admitted with a fulminating meningitis and died, while 3 entered the hospital with cerebro-spinal meningitis (*diplococcus intracellularis*) and recovered.

The method has many advantages and, to my mind, no disadvantage; the primary dressing is removed on the third day, when the stitches are taken out (the only time the patient suffers any inconvenience) followed by the application of spirit gauze which remains on for another forty-eight hours, then finally collodion wool, which is allowed to separate of its own accord.

It would be invidious for me to detail my technic, but it closely

## Letters to the Editors

follows in every respect that carried out by Sir W. Arbuthnot Lane in the fixation (plating) of fractures by the open method, and those who have seen him operate in such cases will fully appreciate what I mean. However, as the method I carry out on closure of the post-auricular wound is entirely different from anything I saw in Europe last year, I trust it will not be looked upon as presumption on my part if I detail it.

The whole thickness of the lips of the wound is approximated by two on end or vertical mattress sutures of silkworm-gut, taken out of hot saline (needle and suture being sterilised together). I mention particularly that the wound is only approximated, in many cases the lips being left apart 1 to 2 mm., while the accurate adjustment of the skin is carried out with the Michel's clips or Herff's metallic sutures.

I am aware that Mr Tilley's modified method has not become general either in England or America, but having once given it a fair trial, no one would consider carrying out any other.

Many modifications have appeared recently, such as removing the tube or other drainage in twenty-four or forty-eight hours, followed by hot applications; but if heat is considered necessary in any aural condition either before or after operation, there is nothing to compare with dry heat from electric light enclosed in a box sufficiently large to contain the patient's head and face while the eyes are protected with asbestos pads.

In conclusion, it is self-evident from the results of my 300 cases that all Mr Tilley claims for his method has been fully justified.

JAS. C. G. MACNAB, M.D., F.R.C.S.

JOHANNESBURG.

THE EDITORS,

*The Journal of Laryngology.*

SIRS,—I am impelled, by the perusal of the Abstract on Cocaine Poisoning in the issue of the *Journal* of last November, to place on record the following occurrence. It will "point a moral" as well as "adorn a tale."

In an annexe to the operating theatre, an assistant was preparing a woman for the removal of tonsils under local anæsthesia. By mischance he injected, instead of the usual  $\frac{1}{2}$  or 1 per cent. solution of cocaine, a 20 per cent. solution with adrenalin. In two minutes the woman collapsed and he recognised his mistake. He called to me and I said, "put her on the table." The tonsils were immediately enucleated by the dissection method and the throat mopped. At the same time the house-surgeon was requested to ask Professor Stockman, who was in the hospital, to come. This he did at once. Hot bottles were placed around the patient. Respiration had ceased but the

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pulse was good. The face was livid: the pupils were dilated but not widely. Immediately she was placed on the table she had a convulsive attack, assuming a position of opisthotonus. As Dr Stockman entered the theatre he ordered artificial respiration and hypodermic injection of ether. The pulse gradually failed, and in half an hour it became imperceptible, and the heart sounds could no longer be heard. During this time the epileptiform attacks recurred. I then suggested that the artificial respiration should be continued with oxygen. To this Dr Stockman agreed. After another twenty minutes or so voluntary breathing was gradually re-established and the pulse could again be felt. The patient was carefully watched, oxygen being administered at intervals. She had one or two more epileptiform attacks. In about three hours consciousness returned. The next day she was drowsy, but on the following day she had practically recovered. She made an uneventful and complete recovery.

I have no doubt that the artificial respiration saved her life, and probably the oxygen contributed in large degree. The immediate enucleation of the tonsils released some of the cocaine which remained in the tissues. It was computed that the equivalent of 24 grains of cocaine was injected.

W. S. SYME.

GLASGOW.

## OBITUARY

GEORGE NIXON BIGGS, M.B., B.S. (Durham),

Lieut.-Col. R.A.M.C. (T.); Lieut.-Col. R.A.F.

Surgeon to the Ear, Nose, and Throat Department, Seaman's Hospital, Greenwich, and Surgeon-in-Charge of the Ear and Throat Department, Royal Waterloo Hospital for Women and Children.

It is with deep regret that we record the death of George Nixon Biggs, M.B., B.S., which occurred on 10th November at the early age of forty-one, after a protracted and distressing illness following an operation for appendicitis.

By his death British Laryngology and Otology have lost one of their most energetic sons, and the medical world has been deprived of a man of exceptional ability. Nixon Biggs was born on 28th March 1881, the only son of M. G. Biggs, M.D., for many years a Member of the Council of the British Medical Association and Chairman of the Central Ethical Committee. Nixon Biggs was educated at Westminster School. He began his medical studies at St Thomas's Hospital, later spending a year at Durham University, where he took the degree of M.B., B.S. Starting his career as a Laryngologist and Aural Surgeon, he held successively the appointments of House-Surgeon



GEORGE NIXON BIGGS, M.B., B.S.(Durham)  
Lieut.-Col. R.A.M.C.(T.); Lieut.-Col. R.A.F.



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and Senior Clinical Assistant to the Royal Ear Hospital; Senior Clinical Assistant and Registrar to the Metropolitan Nose and Throat Hospital; and Surgeon to the Ear, Nose, and Throat Department, Evelina Hospital for Children. On retirement from this appointment—to become Surgeon-in-Charge of the Ear and Throat Department, Royal Waterloo Hospital for Women and Children—he was honoured by being made Consulting Aural Surgeon.

At the time of his death, he held, in addition to these appointments, that of Surgeon to the Ear, Nose, and Throat Department, Seaman's Hospital, Greenwich. To his work at Greenwich Mr C. C. Choyce pays the following tribute:—"Here, as teacher in practical Rhinology, Laryngology, and Otology in the post-graduate school (London School of Clinical Medicine) he enjoyed great popularity amongst post-graduate students on account of his unfailing courtesy and unwearying patience in the demonstration of his specialty." Mr Biggs was Aural Surgeon to the Hospital for Nervous Diseases, Maida Vale.

The Great War gave him an opportunity of proving the value of his previous work in the R.A.M.C. (T.). From an early period of his life he had taken great interest in the R.A.M.C., and after serving in the Volunteers in his student days, he joined the Territorials at their inauguration and was soon promoted to Major. He was one of those who regarded Lord Roberts's warnings, and, foreseeing war with Germany, he worked very hard and enthusiastically to improve his Territorial unit and to perfect the details of the scheme for its mobilisation; for years, his only holiday was taken in camp during the annual training.

Mr Biggs was called up on 3rd August 1914, as Major and Registrar of No. 4 Territorial General Hospital (King's College Hospital), where he had the difficult task of training many civilian practitioners and others in military methods. It was largely owing to his energy and suavity that, from small beginnings, this hospital was equipped and extended so rapidly. After two and a half years of activity there, he was, in 1917, promoted to Lieut.-Colonel, and sent to France in command of No. 54 Territorial Hospital. Later, he was made Consulting Aural Surgeon to the Boulogne district. He was mentioned in Despatches, and made a Commander of the Military Order of Avis (Portugal). He was afterwards given the Territorial Decoration, and on his return from France, in 1918, was appointed Consulting Aurist and Laryngologist to the Royal Air Force. He was made President of the Central Appeal board of the Air Ministry.

Sir Herbert Waterhouse writes:—"To every officer of the R.A.M.C. (T.) who was, during the War, connected with the 4th London General Hospital, the death of Lt.-Col. G. Nixon Biggs must have come as a painful surprise, because we knew him during

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the time he was Registrar of that Hospital, as a man of splendid physique, who seemed to have many years of useful life before him. Prior to the War, my acquaintance with Colonel Biggs was a comparatively slight one. I knew him as a capable Aural Surgeon, and as an enthusiastic Territorial officer. When, at the outbreak of War, I received my mobilisation paper signed G. Nixon Biggs, Major Registrar, I went to the 4th London Hospital to gain some information about my duties. I never shall forget that interview, because, in the brief space of some fifteen minutes, after having answered in the negative the question, 'Do you know anything about the Regulations of the R.A.M.C. (T.)?' I was given in terse and clear language a full account of what was expected of me, and of what I was not to do! I do not think I ever learned so much in a quarter of an hour.

"During the long period that Major Biggs was at the 4th London Hospital I came to appreciate his wonderful business capacity, his tireless energy, his geniality and his consideration for others. I do not think I ever entered his office, and I did so twice or thrice a week, without finding him at work, and always ready to smooth away difficulties, to give helpful advice, and to do his utmost for the welfare of the Hospital.

"He knew everything that was going on in the institution, and devoted himself entirely to its best interests. When, later in the War, he was promoted and sent out to France he did valuable service and was mentioned in Despatches, but he will always be known and remembered as the admirable Registrar of the 4th London General Hospital where he endeared himself to all his colleagues by the charm of his manner, his great enthusiasm for his work, and his wonderful business capacity. The fact is that Biggs was a superman."

Mr Claude Frankau writes :—"George Nixon Biggs was appointed Surgeon to the Throat, Nose, and Ear Department at the Royal Waterloo Hospital in 1911, a few months after the Department had been started. He brought with him a reputation of being a skilled and careful operator, and greatly enhanced his reputation by his work at the Waterloo. By his enthusiasm and kindness he at once achieved great popularity amongst his patients, and rapidly developed a clinic which in proportion to the accommodation available was as large, if not larger, than any other in London. A man of great personal charm he was extremely popular amongst his colleagues, some of whom had further cause for appreciating him in his work as Registrar at the 4th London General Hospital, and as Commanding Officer of the 54th General Hospital during the War."

The *British Medical Journal* says :—"Although the activities of his laborious hospital appointments and busy private practice would have overwhelmed many men, Biggs' power of work was such that he was able to devote enthusiastic attention to many other sides of



## General Notes

life. No friend ever called upon him for help without immediately securing ungrudging devotion of time and energy. In his private capacity his unselfishness, kindness, and gentle courtesy never seemed to fail. A man of keen enthusiasms and of lovable character, George Nixon Biggs will be greatly missed." IRWIN MOORE.

## GENERAL NOTES

ROYAL SOCIETY OF MEDICINE,

1 Wimpole Street, London, W.1.

*Section of Laryngology*—*President*, Charles A. Parker, F.R.C.S. Ed. *Hon. Secretaries*, T. B. Layton, D.S.O., M.S., and J. F. O'Malley, F.R.C.S. A special informal Meeting of the Section will be held on Friday, 5th January, at 4.45 P.M., its object being to discuss cases which present a difficulty in diagnosis.

The next Ordinary Meeting of the Section will be held on Friday, 2nd February, at 4.45 P.M. Members desirous of showing patients or specimens are requested to send notice of the same to the Senior Hon. Secretary, Mr T. B. Layton, 10 Welbeck Street, London, W.1, at least twelve days before the Meeting.

*Section of Otology*—*President*, Hunter F. Tod, F.R.C.S. *Hon. Secretaries*, F. J. Cleminson, M.Ch., and Archer Ryland, F.R.C.S. Ed. The next Meeting of the Section will be held on Friday, 19th January, at 5 P.M.

Members desirous of showing patients or specimens are requested to send notice to the Senior Hon. Secretary, Mr F. J. Cleminson, 32 Harley Street, London, W.1, at least twelve days before the Meeting.

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BRITISH MEDICAL ASSOCIATION, PORTSMOUTH, 1923.

The Ninety-first Annual Meeting of the British Medical Association will be held in Portsmouth in July, under the Presidency of Mr Charles P. Childe, F.R.C.S., Honorary Senior Surgeon of the Royal Portsmouth Hospital.

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Professor Wilhelm Uchermann of Christiania, having attained the age of seventy years, has retired from the Chair of Otology and Laryngology in the University of that city. It was due to his untiring efforts that the first Professorship in the specialty in Scandinavia was founded in 1891, in the University of Christiania. He himself was nominated Professor in 1896, and later, in 1911, Otology and Laryngology were placed upon a similar footing to that of the other medical specialties and became subjects of examination in the curriculum. We desire to congratulate Professor Uchermann on what he has accomplished in establishing the academic position of the specialty, and we wish for him a long period of well-deserved rest and enjoyment.

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THE ÓNODI COLLECTION.

Readers of the *Journal* will recall the circumstances in which this collection was acquired by the Royal College of Surgeons of England,

## General Notes

after its purchase from Dr Ladislaus Ónodi by members of the Section of Laryngology of the Royal Society of Medicine.

The investigation, description, and cataloguing of the collection was placed in the capable hands of Mr T. B. Layton, M.S., and the work has been progressing steadily during the past year. Accommodation in the Museum of the College has been provided in the upper gallery of Room II., where special shelves have been erected. The mounted and finished specimens occupy a place adjacent to Mr Arthur Cheate's magnificent collection illustrating the anatomy and pathology of the Ear.

To quote from Sir Arthur Keith's recent Report, we read that the total number of specimens in the "Adult Series," preserved in formalin and spirit was 115. Of these, 90 preparations have now been made and mounted. Of these, again, 34 have been identified in Professor Ónodi's published works—namely, 12 in Dr Dan McKenzie's translation of "The Relations of the Lachrymal Organs to the Nose and Nasal Accessory Sinuses," and 22 in Dr Lückhoff's translation of "The Optic Nerve and the Accessory Sinuses of the Nose."

The original specimens, 90 in number, which were photographed for Ónodi's work on "The Nose in Children" still await identification and preparation, and it is hoped that this will be accomplished in the course of another year.

In addition to the wet preparations in the Collection, there are many which are macerated and dry which have been obtained from more than 100 skulls. Mr Layton has also examined and selected a number of them for exhibition.

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### "SHRUNK-HEADS, EAR-PLUGS, AND LABRETS."

Under this title Sir John Bland Sutton gave a very interesting address, entitled, "Spolia Nemoralia," at the *Conversazione* of the Royal Society of Medicine, held at 1 Wimpole Street, on the evening of 8th November. It was published in full in the *British Medical Journal* of 18th November.

In his description of the customs of the Indian tribes inhabiting the Amazonian forests, Sir John dwelt upon and illustrated the extraordinary practice prevalent amongst the Indians of perforating the lobules of the ears and inserting plugs often of a diameter which resembled that of a bung. Some of the ear lobes become so distended in this way that they reach almost to the shoulders and resemble the wings of bats.

In British East Africa, the Masai and Kikuyu have a similar practice, and when the plugs are detached, the holes produced by them are so large that the lobule can be looped over the helix and thus serve as a protection to the meatus. The deformed ears become a source of great pride to the possessor and an envy to his neighbours. When men quarrel they snatch at the ear-loops and attempt to tear them.

"Shrunk-heads, ear-loops, and labrets appeal to me," said Sir John in concluding his address: "My father taught me to stuff birds at the time my mother stuffed me with the creed and the ten commandments. Later in life, I saw savages ornamented with feathers, skins, teeth, and claws in tropical forests; similar decorations are worn by fashionable human beings, who strut in Piccadilly or parade the paddock at Ascot."

# The Journal of Laryngology and Otology

(Founded in 1887 by MORELL MACKENZIE and NORRIS WOLFENDEN)

## FURTHER REMARKS ON ANGEIOMATA OF THE LARYNX.\*

By IRWIN MOORE, M.B., C.M.(Edin.), Surgeon to the Hospital  
for Diseases of the Throat, Golden Square.

SWEETSER<sup>1</sup> (Minneapolis) has recently reviewed (1921) the subject of hæmangiomas of the larynx, and also recorded another case. The importance of the subject is shown by the fact that three authors, viz., New and Clark, Sweetser, and the present writer (Irwin Moore), were simultaneously, and unknown to each other, reviewing these neoplasms mainly from the point of view of operative interference and hæmorrhage.

Sweetser confirms that the larger number of these cases occur in males, and from the records of 38 cases he estimates them at 66 per cent. He quotes the papers of Phillips and Ruh, Emil Mayer, also New and Clark, published in 1913, 1916, and 1919 respectively—the last-named authors having found 52 cases of angioma of the larynx (44 hæmangiomas and 8 lymphangiomas) recorded up to September 1919. To this number they added 3 cases of hæmangioma observed in the Mayo Clinic, making a total of 55 cases.

Sweetser refers in a footnote to the more recent study by the present writer (Irwin Moore) of 73 cases of angioma (65 hæmangiomas and 8 lymphangiomas) in a paper read before the Section of Laryngology, Royal Society of Medicine, in June 1920, and published in the *Journal of Laryngology and Otology*, January and February 1921, prior to the presentation

\* Supplemental to a review published in the *Journal of Laryngology and Otology*, 1921, vol. xxxvi., pp. 11-26 and 49-71. For references to authors mentioned in the present paper, see Bibliography published with the above review.

of his (Sweetser's) paper in October 1920, and its publication in the *Laryngoscope* in October 1921.

To the total number of cases reviewed by the present writer, Sweetser's case must now be added as one of true hæmangioma.

It occurred in an infant boy, and the first symptoms arose, when nine days of age, in a series of attacks of cyanosis with increasing dyspnœa, and regurgitation of milk coloured with blood, suggesting asthma or possibly laryngeal diphtheria. Intubation was attempted eight weeks later for the relief of urgent dyspnœa, but the tube could not be introduced into the larynx, and death followed immediately from suffocation.

Autopsy showed a diffuse, flattened, greyish-purple, sub-glottic swelling of the mucosa 2 to 3 mm. below the vocal cords, extending for 5 mm. to the lower border of the cricoid cartilage, and occupying the entire circumference of the larynx with the exception of a narrow space at the posterior commissure (Figs. 1 and 2).

Microscopically, the growth consisted of a narrow area of dense fibrous tissue beneath the covering epithelium, the main portion of the tumour consisting of both large and small, closely set newly-formed blood channels or cavernous spaces, with very thin walls and prominent endothelium, surrounded by a delicate stroma of primitive connective tissue. A hæmorrhage had occurred laterally between the thyroid cartilage and the tumour, extending into portions of the tumour itself.

Sweetser says that the tumour, which corresponded in every respect to a true hæmangioma, was congenital, had been growing since birth, and that the hæmorrhage into it was probably caused by the attempts at intubation, with consequent complete closure of the already markedly constricted air passages.

Only 6 other cases of primary angioma of the larynx have been previously recorded under the age of 20 years: one in a girl aged 19; one in a boy aged 13; another in a boy aged 6; and three in infants less than 1 year old.

Sweetser acknowledges the generally accepted view that angiomatata are congenital, and points out that they increase in size, as a rule, for some time after birth, and then usually tend to become encapsulated and to remain stationary, as pointed out by Ewing.<sup>2</sup> This accounts for the absence of urgent symptoms during adult life, in the majority of cases, and has an important bearing on the question of the necessity of operative interference. The case mentioned by Morell

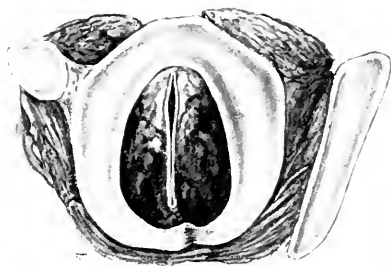


FIG. 1.—A Subglottic Hæmangioma in an Infant eight weeks of age.  
(Sweetser's Case.)

Transverse section through the larynx below the vocal cords, showing the tumour occupying nearly the entire lumen of the larynx.

This illustration has been reproduced from a photograph kindly supplied by Dr Sweetser.



FIG. 2.—A Sessile Cavernous Angioma on the summit of the Left Arytenoid, and a Pedunculated Angeio-fibroma attached to the Anterior Commissure. (New and Clark's Case.)

This illustration is reproduced from an article by G. B. New and C. M. Clark (Rochester, Minnesota) entitled "Angiomas of the Larynx : Report of Three Cases." See *Ann. Otol., Rhinol., and Laryngol.*, 1919, vol. xxviii., Case 2, Fig. 1, p. 1033.

The abstract of the case was published in the review by Irwin Moore on "Hæmangiomas of the Larynx." See *Journ. Laryngol. and Otol.*, 1921, vol. xxxvi., p. 55.



# Angeiomata of the Larynx

Mackenzie, and later recorded by Wolfenden and Bond (referred to later), exemplifies this point.

New and Clark refer to the general impression that angeiomata do not increase in size after the patient is 10 years of age, and they state that their investigations show that the symptoms occur more often after the age of 20, which they suggest indicates some exciting cause as a factor.

Whilst acknowledging the congenital origin of these tumours, Sweetser somewhat contradicts this opinion by looking upon the laryngeal hæmangeiomata seen in adults as different from those found in infants and children—in regard to their situation and characteristics—and by recognising two types:—

1. *An adult type* occurring almost always *upon or above the vocal cords*, accompanied by hoarseness and only occasionally slight dyspnœa.
2. *An infantile type* occurring always *subglottic* and characterised by serious interference with respiration. The tumour in these cases, he says, is sessile and diffuse.

His opinion is not, however, confirmed by the present writer, who found from a study of 73 cases, the total number recorded up to June 1920—in 66 of which the situation of the tumour was definitely stated—that only 4, or at the most 5, could be definitely described as subglottic in origin, or to have extended subglottically, and of these only 2 occurred in children.

Sweetser excludes from his classification the case recorded by Levbarg (New York). An abstract of this case was published by the present writer in his review, but excluded from his list of laryngeal hæmangeiomata because the tumour was primarily in the mouth and pharynx, and though it was said to have involved the larynx by secondary extension, there was no evidence to show that an angeiomatous tumour was actually present in the larynx.

Sweetser also excludes a case recorded by Fallas<sup>3</sup> (Brussels) in 1912, which he considered could not be placed in either of these groups, as the involvement included the arytenoids, ventricular bands, left true vocal cord, subglottic region, the pharyngeal mucosa, and skin of the neck. He suggests, however, that the latter case should be added to the 73 cases recorded by the present writer, but it was excluded for the reason stated by Sweetser, viz., that the tumour was too diffuse

## Irwin Moore

in character to be included under the title of "Hæmangeiomata of the Larynx," and because the larynx was probably secondarily involved.

The case in question was that of a girl, aged 19, who suffered from roughness of the voice. During childhood she had been operated upon for a tumour on the left side of the neck. On the anterior surface of the neck, to the left of the middle line and above the manubrium, were several venous dilatations. The posterior surface of the pharynx was covered by an irregular mass of dilated veins, continued upwards into the nasopharynx and downwards into the larynx. The arytenoids were also involved by a bluish mass which partially obscured the larynx. The same condition was seen upon the ventricular band, also the left vocal cord, and extended into the subglottic region. No dyspnœa or cough was present, and the patient had never suffered from any hæmorrhage. No interference with the tumour was advised.

Thomas J. Harris<sup>1</sup> (New York), in June 1921, presented a case of hæmangioma of the larynx before the American Laryngological, Rhinological, and Otological Society. Patient was a male, aged 30, whom he had first seen six years previously, complaining of occasional hoarseness, and expectoration, on two or three occasions, of a small quantity of blood. A dark-coloured, pedunculated growth, the size of a large pea, was seen attached to the anterior third of the right vocal cord. It was removed, by the indirect method, with a laryngeal snare, without any hæmorrhage. Microscopic section showed that it was a hæmangioma of cavernous type. Recurrence took place three years later. The application of radium proving ineffectual, the growth was again removed by the snare. Following a slight expectoration of blood two years later, a second but smaller recurrence was observed, which was distinctly sessile. It was removed by suspension laryngoscopy without any hæmorrhage. A week later radium (102 mg.) was applied, by the indirect method, to the site of the growth, and 185 mg. externally—for three and a half hours.

Harris refers to the reviews of Emil Mayer (1916), also of New and Clark (1919), and says that the addition of his own case to the 44 hæmangeiomata recorded up to September 1919 by the latter authors, makes a total of 45 to date (June 1921). He has, however, overlooked the present writer's review of 73 cases of angioma (of which 65 were hæmangeiomata) recorded



## Angeiomata of the Larynx

up to June 1920, and he does not mention the case recorded by Sweetser.

Referring to the rarity of recurrence of these tumours, Harris remarks that, so far as he could discover, the recurrence in his case was not entirely an exception. In this connection the present writer found that amongst the 73 cases of angioma recorded, recurrence after removal of the tumour occurred (and on several occasions) in only one other case of true hæmangioma (case seen by Morell Mackenzie, and recorded by Wolfenden and Bond), and in only one case of lymphangioma—a few months after removal (Koschier's case).

Cavanagh,<sup>5</sup> in 1922, has recorded the most recent case of hæmangioma of the larynx in a male, aged 32, who had complained of hoarseness and cough for five years. His condition was diagnosed as tuberculous, and he was sent, early in 1921, to a sanatorium for several months, but no evidence of tuberculosis could be found. Later, the same year, he was seen by the author, and was examined laryngoscopically *for the first time*, with the result that a small growth with a very slender pedicle, the size of a small bean, was seen at the anterior commissure, and prevented proper approximation of the vocal cords. It was removed through a direct laryngoscopic tube with Paterson's forceps, under general anæsthesia, without any appreciable bleeding, and proved microscopically to be a hæmangioma. Following two weeks' silence, the voice was completely restored to normal. When the patient was examined seven months later there was no trace of the growth.

Cavanagh remarks that this case illustrates the importance of a thorough examination of the larynx in any case of persistent or prolonged hoarseness.

The cases recorded by Harris and Cavanagh are of considerable interest, in the fact that there was complete absence of hæmorrhage at each operation.

The addition of Sweetser's, Harris's, and Cavanagh's cases of hæmangioma brings the total number of angiomata recorded at the present date to 76 cases.

The records of the published cases show that in the majority of the cases of small pedunculated growth removed endo-laryngeally, either by forceps or snare, as also in the case of small sessile growths destroyed by the galvano-cautery, hæmorrhage was not usually troublesome, and when it occurred, was easily arrested by endo-laryngeal methods.

## Irwin Moore

In arriving at a conclusion as to the frequency of hæmorrhage following operative interference, the present writer found that amongst the 65 cases of hæmangioma recorded up to 1920—of which 41 were operated upon—considerable or severe hæmorrhage occurred in 25 cases, and no hæmorrhage or only slight bleeding in 16 cases.

In 19 cases in which the tumour was removed by forceps, severe bleeding occurred in 7 cases, slight bleeding in 4, and none in 8 cases. In 5 cases in which the tumour was removed by the cold wire snare, severe bleeding occurred in 2 cases, slight bleeding in 2, and none in 1 case.

The present writer (Irwin Moore) takes this opportunity of again referring to the case recorded in his monograph, which has been discussed at various times during the past thirty years by Morell Mackenzie, Bond, St Clair Thomson, and others.

Morell Mackenzie in his essay on "Growths in the Larynx," published in 1871, after fully recording his first case, mentioned that he had seen a second case in which an angiomatous tumour was situated on the ventricular band, but no further details were recorded by him.

Wolfenden, seventeen years later (in 1888), in his article on "Angieomata of the Larynx," published in the *Journal of Laryngology and Rhinology*, referred to this patient as John N., aged 44, a bootmaker by trade, whom he had seen at Golden Square Hospital in 1887, and who had been attending the hospital since having first been seen by Morell Mackenzie. The patient suffered from occasional hoarseness, and at varying intervals spat up small quantities of blood. Portions of the tumour had been removed at various times by forceps and guillotine, and the galvano-cautery had also been employed.

The tumour, when seen by Wolfenden, was situated upon the surface and edge of the right ventricular band, in its posterior two-thirds, completely hiding the right vocal cord except in its anterior third. It had the appearance of a *small red raspberry*. A second growth was seen on the anterior extremity of the left vocal cord and ventricular band. Patient stated that the condition then present had existed for over twenty years. An excellent drawing of the growth was published by Wolfenden, and reproduced in the present writer's review, Plate II., Fig. 5.

Bond, ten years later (in 1898), exhibited the same case at a meeting of the Laryngological Society of London (4th November), and described the tumour as a "large angioma

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of the larynx," in a male, aged 55, who had suffered from hoarseness for twenty-eight years, and had, twenty years previously (*i.e.*, in 1878), been under the care of Morell Mackenzie, who first discovered and treated the tumour. There was a history of repeated attacks of spontaneous hæmorrhage apart from the occasions when the galvano-cautery was used. Bond described the tumour at this date as dark-bluish, situated on the right ventricular band, involving quite two-thirds of it, with a separate but small off-shoot above, and a third one on the left ventricular band in front. The true vocal cords were apparently free of the tumour, and the right cord moved only very slightly.

A search amongst the records of Golden Square Hospital<sup>6</sup> has revealed the notes of another case. On 30th July 1900, a patient, named Alfred Day, aged 30, was admitted under Herbert Tilley as an in-patient, suffering from an angeioma of the larynx, and the following history was recorded:—Fifteen years previously (*i.e.*, in 1885), he had attended the hospital as an out-patient for "catarrh of the nose and throat." *There were then no signs of the present affection.* Seven years previously (*i.e.*, in 1885), *patient first began to get hoarse.* The larynx was cauterised, but he gradually got worse, and of late had suffered from nocturnal dyspnœa. Laryngoscopic examination showed a large angeiomatous tumour occupying the right vallecula, and side of epiglottis, stretching from the base of the tongue into the larynx, and involving the right aryepiglottic fold, ventricular band, vocal cord, and arytenoid region. The subglottic region was also involved on both sides. The right vocal cord and arytenoid region could not be seen and were fixed. There was good movement on the left side.

St Clair Thomson,<sup>7</sup> in 1905, in a discussion on a case of "angeioma of the larynx," exhibited by Charters Symonds at a meeting of the Laryngological Society of London (7th April), referred to a coloured drawing which he had of an angeioma of the larynx, occurring in a patient he had seen at Golden Square Hospital, and who had been frequenting that hospital for twenty or thirty years. At a later meeting of the same Society<sup>7</sup> (2nd June), he showed the drawing (made in 1900), and described the tumour—not as a local tumour as seen in the case recorded by Wolfenden (Irwin Moore), but as a form of telangiectasis beneath the mucous membrane. He stated that he had no further notes of the case, but that the patient had been seen in the past by Morell Mackenzie,

## Irwin Moore

Wolfenden, Bond, and others, also that the tumour had caused no trouble, and that there had been no hæmorrhage except when attempts had been made to treat the tumour with the galvano-cautery.

The name and age of the patient recorded on this drawing corresponds with that in Tilley's case, also the laryngoscopic picture is identical with a rough drawing accompanying the notes of the latter case.

It is evident then that the cases recorded by Tilley and St Clair Thomson are one and the same. It is also evident—from the records and clinical descriptions—that the latter case is not the same as the previous one referred to by Morell Mackenzie, and recorded later by Wolfenden and Bond. For example—(1) The names of the patients differ. (2) The age in the former case was 57 at the date when that of the latter was recorded as 30. (3) Hoarseness in the former case had existed for twenty-eight years, whilst in the latter only seven years. (4) The growth in the former case as recorded by Wolfenden, and later confirmed by Bond, was practically confined to the right ventricular band, whilst in the latter case it was much more extensive (see Golden Square Hospital Records previously quoted, also St Clair Thomson's drawing in his *Text-Book on Diseases of the Nose and Throat*, 1st ed. 1914, Plate XIV., Fig. 3, p. 462, reproduced in the present writer's review, Plate II., Fig. 7). (5) In the former case there was a history of repeated spontaneous hæmorrhages apart from the occasions that the galvano-cautery was used, whilst in the latter case hæmorrhages only occurred when the galvano-cautery was employed. (6) In the notes of the latter case, as recorded by Tilley, the patient is said to have attended the Golden Square Hospital fifteen years previously (in 1885) for catarrh of the nose and throat, and from the evidence of the patient *there was then no signs of the tumour*.

In consequence of the publication, from time to time, of these incorrect details, the present writer concluded that the two cases were the same, and that a definite clinical history existed, which extended over a period of thirty years. He accordingly referred to the tumour in his monograph as of slow growth, giving rise to no urgent symptoms, until finally removed by thyro-fissure by Bond. Recent investigations, however, show that a thyro-fissure was only advised and not carried out, patient refusing operation, and later being lost sight of. Allowing for

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these errors, we still have, in the first-mentioned case, a definite clinical history of a hæmangeioma of the larynx extending over a period of thirty years, and without giving rise to urgent symptoms necessitating operative interference. Both patients have been lost sight of, and no later records are available.

## Treatment of Hæmangeiomata of the Larynx.

Sweetser in his paper agrees with the conclusions arrived at by the present writer from a critical review of the recorded cases—that intra-laryngeal removal of sessile angeiomatous tumours is a distinctly dangerous procedure owing to the risk of secondary hæmorrhage. He mentions too the satisfactory results obtained from the application of radium by Ryerson, also by New and Clark (referred to by the present writer in his review), and agrees with them that it is the treatment of choice for the cure of this condition, just as in the case of similar tumours in other parts of the body. Though intubation had been successfully employed by Levbarg, in the case of a baby 10 weeks old, and also by New and Clark in a baby 11 weeks old for the relief of dyspnœa, Sweetser condemns its use in these cases, on account of the risk of traumatism and secondary hæmorrhage, especially in view of the experience he had had in his own case. He approves of tracheotomy for the urgent relief of dyspnœa, and emphasises the point that it should be performed as low as possible so as to avoid such an accident as cutting into the tumour (as occurred in Shurley's case, and caused the death of the patient), whilst every precaution, he says, should be taken for checking any profuse hæmorrhage.

## REFERENCES.

<sup>1</sup> Sweetser.—A paper entitled "Hæmangeioma of the Larynx," read before the Minnesota Academy of Ophthalmology and Oto-Laryngology, 8th October 1920; also before the Minnesota Pathological Society, 19th October 1920. Published in the *Laryngoscope*, 1921, vol. xxxi., p. 797.

<sup>2</sup> Ewing, J., *Neoplastic Disease*, New York, 1922, p. 224.

<sup>3</sup> Fallas, Alfred (Brussels), "Angiome du Pharynx, du Larynx, et du Cou," *Archiv. Internat. de Laryngol., d'Otol., et de Rhinol.*, 1912, vol. xxxiii., p. 99.

<sup>4</sup> Harris, Thomas J. (New York), "A Case of Angeioma of the Larynx," *Trans. Amer. Laryngol., Rhinol., and Otol. Soc.*, 1921, p. 236.

<sup>5</sup> Cavanagh, J. B., "Hæmangeioma of Larynx," *Lancet*, 1922, vol. i., p. 635.

<sup>6</sup> Golden Square Hospital Records, 1900, vol. iii.

<sup>7</sup> Thomson, St Clair, *Proc. Laryngol. Soc. Lond.*, 1904-5, vol. xii., p. 103; *ibid.*, 1904-5, vol. xii., p. 130.

# THE PATHOLOGICAL EFFECTS OF EXCESSIVE SOUNDS ON THE COCHLEAR APPARATUS, CONSIDERED IN RELATION TO THE THEORIES OF SOUND PERCEPTION.\*

By T. RITCHIE RODGER, M.D., F.R.C.S.E., Hull.

IN 1914, when attached to the Ear and Throat Department of the Edinburgh Royal Infirmary, I undertook an investigation of the deafness occurring among boilermakers, and reviewed, at the same time, the experimental work done by Continental otologists on the cochleæ of animals exposed to loud sounds. The detailed results of that study can be read by any who are interested, in the *Journal of Laryngology and Otology*, vol. xxx., 1915.

To-day, I wish to extract from that investigation and review any facts which seem to have a bearing on the various theories of sound perception. This subject, of perennial interest to physiologist and otologist alike, came recently into prominence again on the publication of Wrightson and Keith's book, *The Analytical Mechanism of the Internal Ear*. These writers range themselves on the side of those who deny to the cochlea the faculty of analysing sound, holding that such analysis only occurs when the stimuli have reached the brain centres.

The investigation referred to was not in the ordinary sense clinical, that is to say, the workmen examined were not met with as patients complaining of their occupational deafness. They were sought out in their workshops in Leith, and persuaded four or five at a time to present themselves for examination at an adjacent hospital. Care was taken to include men of all ages, and some of the younger men examined alleged that they were not deaf at all. Forty-eight were examined, that is ninety-six ears. The detailed scheme of the examination, and the results, can be found in the paper referred to. I content myself here with a summary of those findings which have relation to the acuteness of hearing for sounds of different pitch.

The lower limit of the scale was tested with a fork of 32 vibrations per second, and the upper tone limit was determined by means of the Schulze-Struycken Monochord. The normal

\* Paper read before the Physiological Section of the British Association, Hull, September 1922.

## Sounds on the Cochlear Apparatus

upper tone limit has been variously estimated by different observers, but after examining twenty persons with normal hearing, I came to the conclusion that it does not usually exceed 18,000 double vibrations in young persons, although some may reach 20,000 or even higher, while between forty and fifty years of age the average is probably as low as 14,000. Tuning forks  $A_1$  and  $C_2$  (419 and 512 vibrations respectively) were introduced, as it was found after repeated testing in the workshops that the predominant noises fell between these points in the scale. Fork  $C_4$  (2048) was also employed, being as well removed in the upward direction from these medium forks as fork 32 was in the opposite direction.

The hearing acuity for each fork was estimated thus—the vibrating fork was placed close to the examinee's ear, while a watch recorded the number of seconds during which he continued to hear it; the fork was then transferred to my own ear, which was taken to be normal, and the time again noted, the result being recorded as a fraction, examinee's time as the numerator, the observer's as the denominator. Thus, if the former heard the fork for 30" and I heard it 10" longer, acuity was noted as  $\frac{3}{4}$ . It was found that some boys who alleged they were not deaf at all, had quite a distinct depreciation of hearing for forks  $A_1$  and  $C_2$ , although there was no loss for low and high notes. No ear examined failed to show depreciation for the medium forks, although, of the men less than ten years at work, 4 per cent. had no depreciation at all for fork 32, and 10 per cent. none for 2048. In this group the upper tone limit was practically unaffected. One examinee could appreciate 20,000 double vibrations although his hearing for medium forks was reduced to  $\frac{2}{3}$ , while three could hear 19,000, with the medium forks reduced to  $\frac{3}{4}$ . Only 3 per cent. fell below 15,000.

In group 2, comprising men who had been ten to thirty years at work, there was some depreciation all along the scale, but more marked for the medium forks. It was only in group 3, consisting of men over thirty years employed, that all parts of the scale were found to be more or less uniformly affected.

In a word, it was found that in the very early cases depreciation had only occurred, but had also always occurred, in that part of the scale corresponding in pitch to the predominant noises of the workshop; in cases which had passed the early stage, depreciation was found in all parts of the scale, but was more marked in the part corresponding to the pre-

## T. Ritchie Rodger

dominant noises; while in the very advanced cases, the depreciation was uniform.

Putelli of Venice has found that among railwaymen exposed to the shrill engine whistle, depreciation for high forks  $C_4$  and  $C_5$  was demonstrated, without depreciation in the lower parts of the scale.

Having thus proved loss or depreciation of function over varying parts of the scale according to the pitch of the excessive sounds, if we can adduce evidence of post-mortem changes in the cochlear apparatus varying in situation according to varying pitch, we would seem to have established some support for the view that the cochlea is adapted for the analysis of sound. Habermann, in 1906, in his second study of 'boilermakers' deafness, included the post-mortem examination of three cases, and stated that the papilla basilaris showed atrophy, mainly of the basal part, but more or less all over. These cases probably correspond with group 3 of my series, men engaged for many years in their employment. Following Habermann's paper, however, Wittmaack began his experiments on guinea-pigs exposed to the sound of an electric bell placed in their cages, and he was followed by others, among whom may be specially mentioned Yoshii, Von Eicken, and Hoessli. All are in agreement as to the changes found in the organ of Corti. In the least severe cases there was only slight swelling of the hair cells and their supporting cells over a certain area of the basilar membrane, and in the most severe, that is in the case of the animals longest exposed, there was such an extensive atrophy of a section of the whole end-organ that nothing of it remained beyond the merest fringe of flattened epithelium on the basilar membrane. Between these two extremes all degrees of atrophy were found. Only in the most severe cases was there any degeneration evident in the spiral ganglia. Wittmaack had looked upon the condition as primarily an affection of these ganglia, but all the other observers were satisfied that it was essentially an end-organ change with ascending degeneration to the ganglia.

Siebenmann, summing up, in 1915, the researches conducted in his laboratory at Bâle, says that a shrill pipe produced changes, first and predominantly, in the lower part of the basal coil of the cochlea;  $C_5$  in the upper part of the same coil,  $C_4$  in the part between the 1st and 2nd coil,  $C_2$  in the second turn, C between the 2nd and 3rd, A in the 3rd coil.



## Sounds on the Cochlear Apparatus

Although in man we have to depend for the most part on clinical observation during life, and in animals almost entirely on post-mortem appearances, still, the structure of the cochlear apparatus being essentially similar, we are justified in correlating the results of both observations. We may assume that the actual pathological condition in the cochlea, corresponding to the clinical signs of boilermakers' deafness described above, was a degeneration of the organ of Corti, localised or generalised according as the case was an early or a long-standing one; on the other hand, we may assume that had we means of testing the hearing of animals more accurately, we would find, in those experimented upon, analogous deafness for the particular tone to which they had been exposed.

The resonance theory, as elaborated by Helmholtz, although suggested by Bell a century ago, assumes that each of the 20,000 to 30,000 nerve-fibres in the cochlea and their corresponding endings is attuned to respond to a particular pure tone, whereas, even with the use of a pure tone, these experiments on animals showed atrophy extending over quite a wide area of the structures on the basilar membrane.

This, however, is quite in accord with Gray's modification of Helmholtz's theory, his "theory of maximum amplitudes" Gray holds that Helmholtz is essentially correct, but that the basilar membrane, being continuous longitudinally, cannot yield a strictly limited transverse response to the stimulus of a pure tone, but that the point in the membrane which corresponds exactly with that tone, forms the point of maximum movement, with a gradually lessening movement of the adjacent parts above and below this point; the mind, however, by a process of education, refuses to take notice of any but the maximal stimulus.

Gray adduces the analogy of the sense of touch, to which he asserts the auditory function approximates more closely than to any of the other special senses. The excitation of the hairs of the hair cells against the tectorial membrane by movement of the basilar membrane, he looks upon as similar to the excitation of the touch corpuscles of the skin. He refers to the simple experiment of placing a blunt-pointed instrument against the finger, when contact at a point on the skin is felt; if now, without moving the instrument, the pressure is gradually increased, one is still conscious of pressure only at the same point, although it is obvious that many of the

## T. Ritchie Rodger

adjacent touch corpuscles are being influenced by the in-pressed tissues. The mind ignores all but the maximal impulse.

Gray believes that the area of basilar membrane which is actually in motion in response to a pure tone, represents roughly an octave. If this be so, it is not difficult to believe that continued exposure to a sound which, though a pure tone, is loud enough to be injurious, will produce pathological changes over quite a wide area.

It may be objected that the injurious sounds to which boilermakers are exposed are not musical sounds but noises, and the appreciation of noises as compared with musical sounds was one of the admitted difficulties of the resonance theory. Gray, however, has pointed out that every noise has pitch although it can be only approximately determined. The noise emitted on striking a series of substances, metallic or otherwise, may be difficult to locate on the scale, but it is easy to tell that one noise is different in pitch from another, and any one can prove for himself in a boiler shop that tuning forks  $A_1$  and  $C_2$  approximate as closely as may be to the noises predominant there.

The statement made by some of the younger men examined, to the effect that they were not deaf at all, is worthy of attention. A person does not generally detect his deafness until he becomes less acute for the hearing of the conversation voice. Now the ordinary range of the human speaking voice falls well below  $A_1$  and  $C_2$ —probably it ranges between 100 and 200 vibrations—and these boys showed depreciation only for forks  $A_1$  and  $C_2$ , not for those used below and above these. We have probably in this another confirmation of the localised distribution of the injury.

If the opponents of Helmholtz's theory are correct, and the basilar membrane moves uniformly throughout its whole length in response to every sound stimulus, the analysis of sound being postponed till the impulse reaches the cerebral cortex, how are we to explain this localisation of pathological appearances in the cochlea?

It is true that the clinical symptoms here described might equally well be explained by supposing an atrophic degeneration occurring in patches in the receiving area of the cerebral cortex; but in these experiments we have actual evidence of such a degeneration in the cochlea; and moreover, all observers quoted agree that the pathological process, even in

# Sounds on the Cochlear Apparatus

the most advanced cases, never extends beyond the spiral ganglia. The trunk of the auditory nerve is not involved, and we have therefore no reason to assume that any central degeneration can have simultaneously occurred.

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## TEMPORO-SPHENOIDAL ABSCESS.

By FRANCIS MUECKE, C.B.E., F.R.C.S., Assistant Surgeon,  
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MAY I draw attention to a few points in the treatment of temporo-sphenoidal abscess as illustrated in the progress of two apparently almost hopeless cases. Both were transferred from the medical wards, and I am much indebted to Lord Dawson and to Dr R. A. Rowlands for their notes of the cases. It is undoubtedly owing to the early diagnosis made by these physicians that much of the credit for recovery is due.

In both cases the mode of onset was somewhat similar, although the eye changes in the child rather pointed, for a time, to tubercular meningitis. The aural conditions in the two cases were very different, both as regards signs and operative findings. One case had every sign of mastoid disease, with a direct necrosed tract through the tegmen to the abscess; the other had signs of previous ear trouble only, and healthy tissue was situated between the indolent clot and the abscess, the mode of infection being therefore probably vascular.

At the operation I am always careful to thoroughly eliminate all the disease in the mastoid and middle ear, paying particular attention to the attic and zygomatic cells.

One of the greatest troubles in the after-treatment of brain abscess is cerebral hernia, which not only blocks drainage but so alters relations that it is increasingly difficult to know the site of the original abscess. This unfortunate condition is best prevented by making as small an exposure of the dura mater as is consistent with the complete removal of diseased bone, and at the same time by making only a small linear incision into the dura mater. If it should be a case of direct extension, the meninges are probably already shut off; otherwise, it is perhaps better to wait one day before proceeding beyond the dural incision, if the condition of the patient allows it.

I am much averse to indiscriminate puncture of the brain matter, because a microscopic examination of the brain, in a fatal case, revealed bacteria in every puncture mark. For this reason I never make more than three explorations, and then wait for subsequent symptoms and signs. The first puncture with the sinus forceps should be forwards and upwards, the next directly upwards, and the third backwards and upwards;

## Temporo-Sphenoidal Abscess

this is in the order of the relative frequency of the site of a temporo-sphenoidal abscess. The forceps should, in every case, be kept fairly superficial.

I believe washing out of the abscess cavity to be unnecessary and frequently dangerous. Drainage of the cavity presents great difficulty owing to the expulsive action of the brain. Gauze and the ordinary rubber tubes are quite useless. A tracheotomy tube may be very useful with a superficial abscess, but by far the best is a stiff rubber tube, one-eighth to one-quarter of an inch in diameter, inserted into the cavity for the same distance as it was found necessary to insert the forceps in order to give free drainage. The tube should be long enough to rest on the lower shelf of the chiselled-out mastoid. Side holes should be made into the upper part of the tube. The mastoid cavity should then be so packed with gauze as to prevent the lower end of the tube from slipping off the shelf.

The operation should be performed as speedily as possible, in order that the patient may escape the damaging effects of prolonged anæsthesia. On no account should an anæsthetic be given for any subsequent probing. In my opinion, there is no question as to the lowering of the patient's general resistance by anæsthetics in these severe and toxic cases.

The dressing should be carried out daily and very thoroughly. The tube must be removed, cleaned, and replaced. It is advisable to shorten the tube gradually as symptoms indicate. Should there be any suspicion of blockage, indicated either by direct observation or from the symptoms, one must not hesitate to insert the sinus forceps along the original track. As these abscesses are frequently multiple, the surgeon should always be prepared for further explorations if symptoms indicate it. The case should never be given up as hopeless.

If a hernia shows signs of developing, the mastoid cavity should be packed firmly with gauze soaked in spirit.

CASE I.—Mrs A. B., aged 52, on the 10th December 1921 developed acute otitis media in the right ear following a cold. Except for the continuance of the aural discharge she apparently recovered, and went about her ordinary duties. On 25.12.21 she developed a severe "bilious attack," lasting fourteen days. She was occasionally delirious. 20.1.22—Although not confined to bed, she had "earache" and occipital headache. 3.2.22—Admitted to hospital. She complained of headache and great lassitude. 4.2.22—She became semi-conscious, with cerebral vomiting. The fundi showed marked

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neuritis; pulse 120; respiration 24. Slight double ptosis developed, with flaccidity and pains of the left side of the face, left arm, and leg; Babinski positive on left side; pupils equal and reacting normally. The right ear showed foul-smelling discharge, and much redness and swelling of the posterior osseous meatal wall, and there was deep mastoid tenderness. The cerebro-spinal fluid was clear and not under pressure: it was sterile. Incontinence of urine and fæces and complete unconsciousness came on in the evening.

*Operation.*—The mastoid was found to be definitely infected, with a track of caries through the tegmen antri. The dura mater was bulging and discoloured. Sinus forceps inserted forwards and upwards, through a small dural incision, disclosed pus immediately; about 3 oz. were evacuated. The abscess was drained in the manner described above.

*Progress of Case.*—6.2.22—She could be roused; micturition was normal. 8.2.22—Complete coma present; paralysis of the whole of the left side, including the face; incontinence of urine was again present. Sinus forceps reinserted in the original track and much pus was evacuated. 29.2.22—Continuous gradual improvement was noticed, with decreasing weakness of left side; very lethargic but easily roused. Incontinence of urine was still present. The drainage tube was much shortened; there was little discharge. 1.3.22—Temperature and pulse rose; again comatose, with complete left hemiplegia and incontinence. The sinus forceps located a second abscess situated four inches directly upwards. A large tube four inches long and one-quarter inch diameter was inserted. 4.3.22—Drainage excellent, but patient still comatose. 12.3.22—She can be easily roused and the mental condition is much improved; there is some movement in the muscles of the left side. 25.3.22—Gradual improvement—slow speech and cerebation. She moves her limbs when asked to do so. Incontinence is improving. 7.4.22—Drainage tube was now removed and gradual recovery took place. 18.4.22—Patient was sent to the convalescent home with the wound healed and the mental condition almost normal: movement of the left side was fair, and she could just walk with assistance. 31.10.22—Patient was living a normal life, with no muscle weakness, and she was somewhat rejuvenated in ideas.

CASE II.—D. K., aged 5, on 17.8.22 suffered from "bilious attack," lasting three days, with much vomiting; then earache developed on the right side, followed quickly by discharge which ceased three days later. During the next six days the child complained of frontal headache, vomiting after food, night sweats, constipation and increasing drowsiness.

29.8.22—Admitted to hospital. Pale, thin child, light-headed, drowsy, and with constant yawning. *Ears*—*Right*, drumhead showed

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healed perforation at lower anterior quadrant; no discharge; slight tympanic redness; no mastoid redness or tenderness. *Left*, drumhead showed slight redness about malleus. *Eyes*—The right pupil was dilated but both reacted. There was no squint: the fundi showed no change. *Face*—Weakness of left side was observed. *Limbs*—Normal, perhaps some lower limb rigidity; Kernig present. *Cerebro-spinal fluid*—Clear, under pressure. Cell count: 28 per c.mm. Type: 88 per cent. small lymphocytes; 12 per cent. polynuclears. Protein: slight excess.

30.8.22—Child was more drowsy, with slight weakness of the left arm and an occasional cry. Babinski was positive on the left side. There was no optic neuritis. 31.8.22—Now semi-conscious, with left facial palsy, and the whole left side exhibits great weakness. 1.9.22—Right external squint and ptosis developed, and the patient could only be imperfectly roused. There was stiffness of the neck, definite left hemiplegia, and the fundi showed slight papillœdema. *Cerebro-spinal fluid*—Cell count, 26 per c.mm. Differential count, 23 per cent. polynuclear; 27 per cent. small lymphocytes. A temporo-sphenoidal abscess was diagnosed.

*Operation.*—The mastoid had a normal appearance, but the antrum was occupied by a semi-solid, jelly-like cast. The sinus was healthy. Dura mater inflamed but not bulging, and, when incised, clear fluid escaped under pressure. The sinus forceps, passed forwards, upwards, and backwards into the temporo-sphenoidal lobe, gave no result.

*Progress of Case.*—On 2.9.22—Pneumococci were grown from the antral cast. The patient was quite unconscious, with complete hemiplegia. Sinus forceps was passed forwards and 4 oz. of pus evacuated; a stiff tube was inserted. 4.9.22—The child was better and could be roused. The forceps inserted daily; the abscess was draining. 6.9.22—Child again unconscious; the forceps evacuated 1 oz. of pus. 8.9.22—Child can now be roused; left hemiplegia is present; the right pupil is dilated and fixed, but the facial palsy is better. 15.9.22—Movement is noted for the first time in the left arm. The abscess is draining well with the tube 3 in. in length. 20.9.22—General improvement noted: drainage tube removed. 26.9.22—Some movement in the left leg is present. 4.10.22—The wound is healing; there is no ear discharge; movements are fair and the eye condition stationary. 15.10.22—The child is making uninterrupted recovery: the squint has disappeared and movements are almost normal.

## AN UNUSUAL TERMINATION OF A CASE OF TEMPORO-SPHENOIDAL ABSCESS.

By F. G. WRIGLEY, M.D., Hon. Surgeon, Manchester Ear Hospital ;  
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Royal Infirmary.

THE patient, a man, aged 36 years, had been suffering from chronic middle ear suppuration for seven or eight years. For the last three or four months he had had severe headaches chiefly in the right temporal region. On examination the right meatus contained foul-smelling pus, and on swabbing this away an old perforation was seen ; the meatus rapidly refilled with pus. There was tenderness over the right temporal region and mastoid process. Slight ptosis was observed on the right side, but no nystagmus. The patient was drowsy, but could be roused sufficiently to answer questions. Cerebration, however, was definitely delayed. Pulse rate was 62, temperature 100.6. A temporo-sphenoidal abscess was diagnosed, and operation decided upon.

*Operation.*—The mastoid cortex was dense, and on reaching the antrum there was a gush of pus. Pus was also seen leaking through the roof of the antrum. On following up this track a large extradural abscess was found. The surface of the dura mater was ragged and ulcerated, probably from pressure of the extradural collection of pus. A fine scalpel was inserted into the substance of the temporal lobe, and resistance was met about half an inch from the surface ; this proved to be a tough capsule, and, on incising it, and inserting a pair of sinus forceps, a small abscess was found, containing about two drachms of pus. A rubber drainage tube was introduced into the cavity, and the radical mastoid operation completed. Lumbar puncture was performed, and the cerebrospinal fluid was found under high tension and slightly turbid. An examination of the fluid showed an increase of polymorphonuclear leucocytes, but no organisms were found either in films or in cultures.

*Progress.*—For two days there was great improvement in the patient's condition, and then maniacal symptoms made their appearance, which developed in a few hours into coma. Constipation, as is usual in these cases, was a marked symptom, but so far a simple enema had been sufficient. The abdomen



## A Case of Temporo-Sphenoidal Abscess

now became distended and rigid. A surgeon, who was called in, gave it as his opinion that a septic peritonitis was present but could give no definite suggestion as to the cause. In view of the patient's general condition, operation was not considered advisable, and he died about twelve hours after the abdominal symptoms first appeared.

There was no vomiting after the operation, and nothing to suggest that any intestinal obstruction was present. Further, there was no history of previous attacks of appendicitis. The peritonitis might, of course, have been due to a coincident attack of appendicitis, but the rapidity of the onset without any earlier symptoms was rather against this view, and it seemed more probable that the peritonitis was caused by a blood infection from the ear or cerebral suppuration. Although a post-mortem examination was not permitted, the case seems of sufficient interest to allow of a brief report.

## CLINICAL RECORD

### TWO CASES OF FATAL OSTEOMYELITIS OF THE FRONTAL BONE PRESENTING UNUSUAL FEATURES.

By HERBERT TILLEY, B.S., F.R.C.S.

MY reason for publishing brief notes of these cases is because they presented somewhat exceptional features in their earlier stages, although the later and final course of the disease differed little, if at all, from that which has frequently been described in modern text-books on Rhinology and in the literature of our specialty.

In the first patient, who suffered from chronic suppuration of all the sinuses on the right side, the osteomyelitic complication followed the ordinary Caldwell-Luc operation on the antrum, *i.e.*, no other sinus was dealt with at the time.

CASE I.—Mr R. H., aged 45, was seen on 23rd March 1921, complaining of chronic nasal discharge from the right side, with obstruction. There was no headache, but a general feeling of malaise and inability to work. Pus was issuing from all the sinuses: the uncinate process was very swollen. Thick putty-like material was washed out of the antrum.

During the next six or seven weeks the antrum and frontal sinus were irrigated once weekly, and various antiseptics injected into the cavities. Beyond a certain diminution in the amount and in the foul odour of the discharge there was little improvement.

On 5th May I performed the Caldwell-Luc operation in a suburban nursing-home, and did not see the patient again till the 18th, when he returned to report to me, and complained of "neuralgia in the right cheek," which was slightly swollen and tender on pressure. The bucco-antral wound had healed and there was little discharge from the corresponding nasal cavity.

25th May.—The neuralgia persisted, and there was an increase of the external swelling extending to the right lower eyelid and over the ascending process of the right maxilla. The conjunctiva was congested.

26th May.—The bucco-antral wound was reopened and large prominent granulations removed from the roof of the antrum. The underlying bone was hard; no pus could be seen infiltrating it, but a small portion was removed.

12th June.—The right frontal sinus was opened and found to be

## Osteomyelitis of the Frontal Bone

full of pus and lined with large vascular granulations. The sinus was obliterated by complete removal of its anterior and inferior walls and the wound left freely open. The ascending process of the maxilla and the right malar bones were removed at the same time. The outer plate of the frontal bone beyond the external limit of the sinus was chiselled off but no pus was seen in the diploë.

During the following week, and in accordance with the findings of the bacteriologist, injections of a mixed staphylococcic and streptococcic vaccine were given. The disease continued to spread, and on 24th June the soft tissues of the forehead were turned upwards and all inflamed portions of the frontal bone removed.

From now onwards till 8th August there were temporary improvements alternating with recurrences of headache or signs of advancing disease either in the form of local symptoms or increasing constitutional weakness.

14th August.—The patient was aphasic, and symptoms of basal meningitis set in. He died on 18th August.

This was the first case in my experience where an operation on the antrum, in the presence of suppuration in the corresponding frontal sinus, lit up an acute spreading osteomyelitis of the maxillary and frontal bones. There can be little doubt in my mind that the bone inflammation started in the upper and inner region of the antrum, because (1) the initial symptoms were limited to the cheek, the lower eyelid, and the soft tissues covering the ascending process of the maxillary bone; (2) with the further progress of the disease the symptoms of involvement of the frontal sinus and frontal bone became more and more evident.

I suspect that the pus from the untouched frontal sinus infected some bone exposed by the establishment of the naso-antral opening. If my surmise be correct, it would suggest that all infected sinuses should be exposed and drained at one and the same time: it was not done in this case because on many occasions I had satisfied myself that while there was suppuration in the fronto-ethmoidal sinuses, it was very small in amount.

The outcome of the case was for me the more disappointing and unexpected because I irrigated the antrum with saline and peroxide solutions *immediately* before the anæsthetic was given for the first operation, in order to prevent, as far as possible, any complications in the immediate after-treatment which, in this case, would not be in my hands.

## Herbert Tilley

CASE II.—The patient, R. M. N., male, aged 60, was sent to me for consultation after two operations had been performed on the antrum during the month preceding his visit. The report after the second operation was that he had “epithelioma of the right antrum complicating bilateral pan-sinusitis of three years’ duration.” This was arrived at from microscopic examination of the contents of the antrum after the second operation. When I saw him the right cheek and the forehead were swollen, tender, and cedematous, and the temperature  $101^{\circ}$ . The nasal cavities were full of pus and polypi; after clearing the nose I passed a cannula into the right frontal sinus without difficulty, and on injecting warm normal saline solution the soft tissues of the forehead immediately bulged forwards. This was a new clinical feature to me, and obviously meant that the anterior wall of the sinus had been more or less destroyed.

As a result of the two operations on the right antrum already referred to, that sinus was easily entered from the nose and did not appear to be occupied by any growth. Consequently I discounted the report of the pathologist as to “epithelioma” of the antrum, and came to the conclusion that we had to deal with an extensive and acute exacerbation of chronic, bilateral, suppurative pan-sinusitis. The possibility of malignant disease seemed to be remote, because no growth was visible in the nasal cavities; my examination produced no bleeding, nor was there any history of this; while such pain as the patient had was not in the cheek, nor in its neighbourhood, but in the frontal and ocular region and on the vertex. The ballooning of the soft tissues of the forehead when the right frontal sinus was irrigated was an arresting feature, and only capable of the interpretation already referred to.

*Treatment.*—The patient was immediately sent into a nursing-home, and no thought of operating was entertained until the general and local symptoms had subsided. This involved some three weeks’ delay.

On 30th July I made incisions immediately below each eyebrow, joined them by one across the root of the nose, and turned up the soft tissues of the forehead. A truly terrible condition of things was exposed. The anterior walls of the sinuses—they were large—were necrosed, infiltrated with pus, and so soft that it was possible to remove them with a blunt curette. The septum between the sinuses had disappeared and the combined cavities were filled with large fungating granulations. There was no difficulty in clearing the fronto-nasal canals. It did not appear that the diploë bordering the sinuses were infected, but I suspected that they must have been because of the general œdema of the forehead. Stitches were only inserted through the incision over the root of the nose. The immediate result of the operation was

## Osteomyelitis of the Frontal Bone

excellent, *i.e.*, the headache was relieved, the patient enjoyed the best sleep he had had for months, and the appetite and general health improved.

As might be expected, the respite was not of long duration. In about a week or ten days yellow pus began to discharge from the supra-orbital wounds and in increasing quantity from the nose. Œdema appeared over the malar regions, the external angular processes, above the region of the sinuses, and later on over the nasal bones. Further operations were undertaken, and large sequestra removed. By such means suffering was allayed, discharge diminished, and our hopes rose correspondingly.

In addition to the sinus disease, the patient suffered from a recurrence of dysentery, which was not a new experience for him. This was dealt with and finally overcome by my friend Dr Charles Bolton. In spite of many attempts made to remove freely every area of infection, the latter eventually found its way to the meninges and the patient died on 20th November.

This case seemed almost hopeless from the first, when it was obvious that the frontal bone was infected and the anterior wall of the sinus had already broken down. Possibly the course of the disease was similar to that of Case I., *viz.*, infection of the frontal sinuses following on an operation on the corresponding antrum. In any case, I feel sure that we did the right thing in opening up the diseased frontal sinuses, and no one would deny this who had witnessed the patient's gratitude for relief from pain and for the gift of sound sleep which had been so long denied.

In conclusion, I would like to say that I have never seen a case of osteomyelitis of the superior maxilla or of the frontal sinus supervene after an operation for *uncomplicated* suppuration of the antrum. I have read of such, but the instances reported in this communication tempt one to ask whether the ethmoid and frontal sinuses were really healthy when osteomyelitis followed the antral operation.

## SOCIETIES' PROCEEDINGS

### ROYAL SOCIETY OF MEDICINE—SECTION OF LARYNGOLOGY.

**November 3, 1922.**

*President*—MR CHARLES A. PARKER, F.R.C.S.Ed.

#### PRESIDENT'S ADDRESS.

THE honour you have conferred upon me brings to my recollection the time when the old Laryngological Society was founded, especially as it will complete its third decade during my year of office, for it was founded in 1893. It was fathered particularly by Semon, Butlin, Bowlby, Greville Macdonald, and others. Its first President was Sir George Johnson, who was followed by Sir Felix Semon. I was an original member and attended the first meeting of the Society, and thus I have been able to see how the character of the cases met with and the manner of treating them has gradually changed. Thirty years ago, laryngology was still chiefly the physician's province, reliance being placed on internal medication, and the local application of sprays, paints, and powders; but since then, the tendency has been for the methods of treatment to become more and more surgical with an ever-increasing momentum. When I was resident at the Throat Hospital, Golden Square, in 1889, the beds were chiefly filled with cases of chronic laryngitis, and perhaps some cases of tuberculosis of the larynx; and my duty was to proceed from bed to bed and make local applications to the affected part. The work then was chiefly medical, whereas now, practically all the beds in that institution are surgical beds, and surgery predominates. During my residence I never saw a larynx opened, nor a sinus treated otherwise than by puncture: nor did I see a case of acute mastoid treated otherwise than by a Wilde's incision. Yet the staff were not behind the times: Sir Morell Mackenzie, the greatest of pioneers in laryngology, had just retired, and had left his colleagues imbued with the spirit of progress; they were quite abreast of the times. Indeed, they excelled most throat surgeons of to-day in their intralaryngeal manipulations by the indirect method, especially in the removal of innocent laryngeal growths. It would be a pity if this piece of craftsmanship were entirely superseded by the direct method, as is the tendency at the present time.

Thirty years ago laryngology was scarcely regarded as a justified specialty. Now, not only is that changed, but there is even a hope that the Colleges of Physicians and Surgeons may grant a special diploma in oto-rhino-laryngology. And in the time of which I am speaking, it was only London and the larger provincial cities which had laryngologists, whereas to-day it is a specialty well to the fore even in the smaller towns and many country districts. In those early days, even the general

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hospitals looked upon laryngology as of quite secondary importance, and if they had a special department at all, it was staffed by a general physician or an assistant-surgeon. To-day, every important hospital has a good special department in charge of laryngologists in every way on an equality with the rest of the hospital staff.

I think that this Section and the old Laryngological Society have played an important part in bringing about these changes. By their efforts and by their printed *Proceedings* it has been proved to the world that laryngology is a science requiring such a wide field of special knowledge, and such a special technique, that no one now questions that it has justified itself as a specialty. I agree with what Sir William Milligan said as to the Section being an educative body. Younger men, being perhaps for the first time in charge of a clinic, learn by bringing their cases for discussion, and perhaps specially do they learn when views contrary to their own are expressed. It is easy for all, including the senior men, to fall into a rut, and the chief safeguard against that is to meet and rub shoulders with colleagues and to learn what progressive ideas are germinating in the minds of others. But for this, the practice at special hospitals and departments is liable to become stereotyped and lack the spirit of progress. Thus, both seniors and juniors must benefit from having a common meeting-ground. It has been said that each generation starts where its predecessor leaves off, but in this specialty, each man starts where his colleague leaves off, and it is at meetings of this Section that we learn the latest views and methods of procedure, and we receive the stimulus to new ideas which, in their turn, carry us still further onwards. It is in this way that the great progress of the last thirty years has come about. Little by little we have led each other on from one small advance to another, and the sum total of these small advances has meant a revolution in the science and art of laryngology, to the great benefit of suffering humanity.

**Suppurating Dental Cyst. Drained: subsequently obliterated by the Blood-Clot Method** — DAN M'KENZIE, M.D.—Male, aged 45, seen March 1922, with a history of pain in the right cheek for a week, terminating in a discharge of pus and blood from the nose. During a second attack of pain and swelling, pressure on the swollen cheek made pus emerge from the nose; it was found to proceed from an ill-defined swelling, involving the bone, in the floor of the right vestibule. The right antrum was dull on transillumination, but as the right half of the vault of the hard palate was flattened, a diagnosis of suppurating dental cyst was made. An incision made for drainage in the gingivo-labial recess of the upper lip confirmed the diagnosis. In May, the suppuration having subsided, the cyst was opened and the lining membrane removed: no attempt was made to remove the delicate bony wall surrounding the cyst, which occupied most of the right antrum and extended into the hard palate across the middle line. The cavity was allowed to fill up with blood and blood-clot, and the buccal wound was entirely sutured. The result has been satisfactory.

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Mr W. STUART-LOW said he agreed with the treatment in this case. He had operated on a number of such cases by excising the cyst and suturing. He disapproved of prolonged packing, as likely to cause a persistent sinus.

Mr D. L. SEWELL remarked that he had had three cases in which he experienced great difficulty in closing the opening into the buccal cavity, following the usual opening through the cyst wall into the antrum, and from the antrum through the meatus into the nose. In one case a plastic operation was necessary to close the opening.

Mr LAWSON WHALE asked what Dr M'Kenzie and Mr Stuart-Low would have done in a case in which the course advocated was impossible, because the cyst had passed through the socket of the canine into the nasal fossa. When he opened the cyst from below, a probe passed into the nose. He had been unable to do anything but pack; fortunately the cavity had healed.

Mr E. D. D. DAVIS said he had treated thirty-one dental cysts. Eight had been incised, curetted, and packed before he had seen the cases, and as soon as the opening had closed, the cyst had re-formed. Complete excision from the alveolus had been carried out with success. As all the large dental cysts which he had seen had been suppurating and of long duration, he had not adopted Dr M'Kenzie's method, though he intended to do so in future. It was very difficult to obliterate the cavity of a large dental cyst which bulged into the nose and antrum, especially when it extended into the hard palate. Dental cysts, particularly the palatal type, were situated well below the floor of the nose, and drainage into the nose was in most cases unsatisfactory; a persistent fistula sometimes occurred between the mouth and nose when such drainage was established, though careful suturing of the mouth wound might prevent the formation of a fistula. For the reasons above stated he preferred to enucleate the cyst from the mouth and carefully avoid opening into the nose.

Mr E. M. WOODMAN asked what happened when the permanent teeth were implicated in the cyst. He had had a case of a large cyst which was full of thick pus; the roots of the teeth were projecting into the cyst, and were suppurating. But for those teeth he would have employed the blood-clot method. Two definite fistulae were left in the mouth. He drained the cyst, but spontaneous closure did not follow, and therefore he had to pack the cavity.

Dr M'KENZIE (in reply) said that an interval of two weeks had elapsed between the first and second operation. It was the second case he had treated by this method. The first was not such a large cyst, but it healed up satisfactorily. With regard to openings which became permanent, a method had been described in a French paper of cutting a flap from the inner surface of the cheek, and closing the opening with it. He did not know whether the formation of fistulae would be so likely if all cases were treated by the blood-clot method. The origin of these cysts was unknown. Some had no obvious connection with the teeth; in some an unerupted tooth was embedded in the cyst wall, and in others, the roots of permanent teeth were laid bare, doubtless by expansion of the cyst wall. He did not know whether the blood-clot method would answer with very large cysts; at all events he considered it worthy of an extended trial.



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**The Timeous Treatment of the "Broken Nose"**—DAN M'KENZIE, M.D.—Male, aged 21, illustrated how the deformity of a broken nose can be easily and permanently rectified if treated by suitable manipulation before the fractures have had time to unite. Seen five days after the injury, the bridge was swollen, but in spite of the swelling it was seen to be displaced towards the left, while palpation revealed that the right nasal bone was tilted, so that its lower edge formed a prominence under the skin. Internally the cartilaginous septum presented a hard vertical bulge; this showed that it also had been fractured or buckled.

Under chloroform, by external manipulation aided by a flat-padded elevator inside the nose, the deformities were easily reduced. A pad of gauze was inserted for twenty-four hours into the atrium of the nose under the bony bridge, but no apparatus was applied. The result is a straight nose. A depression on the nasal bridge just below the ends of the nasal bones is due to the septal deformity which, to some extent, still exists.

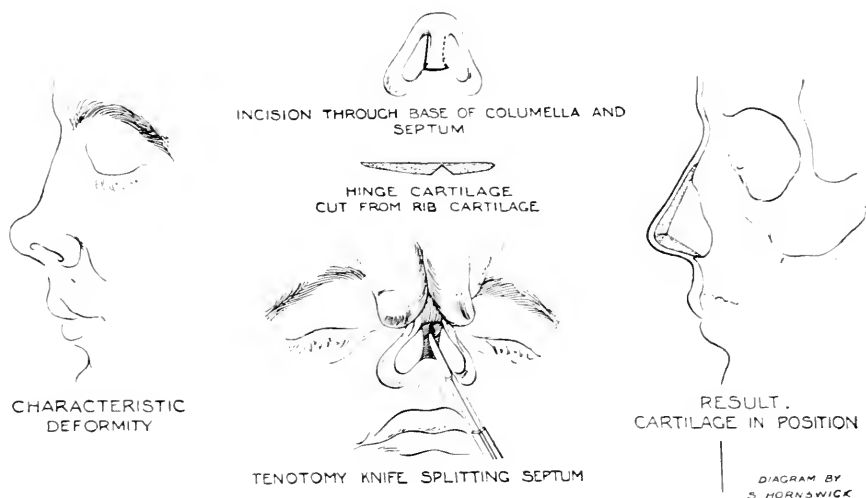
**Injury to the Nose from a Lift Accident**—W. M. MOLLISON, M.Ch.—Patient, aged 21, fractured both maxillæ and mandibles about a year ago. In January 1922, he was suffering from nasal obstruction, with a sinus at the root of the nose. Many crusts were present in the nose and nasopharynx, and bare bone was felt through the sinus. Six months ago removal of several bony sequestra through the nose and the sinus led to much improvement. Three weeks ago a cartilage inlay was inserted. On raising the soft tissues from the very depressed scar of the old sinus an opening was made into the nose and suppuration followed. In spite of this, cartilage, inserted to close the hole, has taken.

**Three Cases of Depressed Fracture of Nasal Bridge with Cartilage Implantation**—H. D. GILLIES, C.B.E., F.R.C.S. — The illustrations on page 86 indicate the method of cartilage implantation.

Mr CHARLES A. PARKER (President) said the results in Dr Dan M'Kenzie's case were very good, but the interior of the nose needed further attention, as there was much chronic hypertrophy of the turbinates and the septum was not quite straight. It was often possible to get the nasal bones in good position and also to straighten the septum, but the difficulty was to prevent the deformity of the latter from recurring; splints and packing seemed to fail. Often, after such injuries, perichondrial thickening occurred, which went on increasing for some time after the accident and led to nasal obstruction, which eventually necessitated submucous resection.

Mr H. D. GILLIES said it was necessary to distinguish between pure lateral displacement and displacement with depression. They were easy to manipulate into position if the fracture was the first the patient had had,

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The Hinged Cartilage Operation for Nasal Support. The Perichondrium is left continuous across the Hinge.



Case of Depressed Bony Bridge of Nose.

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and there was an opportunity of treating it within a fortnight of the accident. After that time he found it necessary to incise at the pyriform opening into the vestibule, and chisel where the bone was fractured, and then reset the bony arch. No splints were necessary. The bone should be mobilised and the nasal bones raised, and the sides of the nose should be pinched in. If there had previously been deformity of the septum, it would not be cured in that way. If the deformity was due to fracture of the septum, the septum should first be resected, and after that the nose reset. If there had been several fractures to the face, he found that no manipulative work was effectual, and that resort had to be made to the use of a graft.

Mr W. STUART-LOW recommended the persistent application of cold in these cases, continued for hours after the occurrence of the fracture. This prevented effusion into the nose and tissues, and so avoided subsequent thickening.

Mr A. J. M. WRIGHT said that in some cases he had been able, by exerting considerable force, to get the bones back into position within three or four weeks of the accident. On three occasions he had used a cartilage graft from the septum where there was not extreme depression, and the result had been quite satisfactory.

Sir JAMES DUNDAS-GRANT said that in cases in which the nose was driven to one side, placing a fold of lint on the other side of the nose and hammering with a mallet was sometimes very effective. In regard to "timeousness," he referred to a case in which he had quickly reset the broken nose of a rider pitched on to his pony's head at polo (he had been rendered unconscious) before consciousness returned.

Dr M'KENZIE (in reply) agreed that it was important to get these cases before a fortnight had elapsed. If general surgeons and practitioners would only recognise that fact, they would probably send cases to the rhinologist early, when they could be dealt with successfully.

Mr GILLIES, in reply to Mr Mollison's query, said that in his war cases cartilage sometimes became infected, but if well drained some of the cartilage might survive. He considered that in the case exhibited by Mr Mollison, the face should have been brought forward first and the nose remodelled afterwards.

## **Submaxillary Gland containing a large Salivary Calculus—**

DAN M'KENZIE, M.D.—The submaxillary gland was removed from a patient from whom, on two previous occasions, large salivary calculi had been extracted. The gland was removed at the patient's request, and a third calculus, the presence of which was unsuspected, was found in it after dissection.

Mr CHARLES A. PARKER (President) exhibited a specimen of a salivary calculus which he had removed from a female patient several years ago, and Mr A. A. SMALLEY said he had also recently removed a fairly large salivary calculus from a patient who was thought to have malignant disease.

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Mr NORMAN PATTERSON said that in some cases two calculi were present, therefore when one was removed it should be carefully examined, as sometimes a smooth facette was discovered which gave the clue to the existence of a second stone.

**Papillomata of the Trachea**—SIR JAMES DUNDAS-GRANT, K.B.E., M.D., and J. J. PERKINS, M.B.—Boy, aged 14, with no chest trouble until two years ago, when he caught a cold which was followed by gradually increasing dyspnoea. Admitted to hospital with loose cough and non-offensive sputum—occasionally streaked with blood; no history of foreign body, no tubercle bacilli, but marked inspiratory dyspnoea, with retraction; dullness at right base; diminished breath sounds; signs, posteriorly, of dilated tubes; expiratory rhonchi over rest of lungs. On 3rd August a large, lobulated, fleshy growth was seen on laryngoscopy, forced up from below the right vocal cord during expiration. A diagnosis of fibroma of the trachea was made. 5th August—Attempts at removal by suspension laryngoscopy failed on account of the dyspnoea, so tracheotomy was performed. Through the tracheotomy opening the trachea was seen to be almost completely filled by papillomata, which were removed through a bronchoscopic tube passed through the tracheotomy wound. 10th August—A further papilloma was removed in the same manner, since it could not be reached by suspension laryngoscopy. 11th August—A few papillomatous remains were treated by calcium and magnesium internally. 3rd October—Larynx clear and all symptoms had disappeared.

Mr CHARLES A. PARKER (President) said that the case illustrated the progress which had been made in the direct examination of the respiratory passages. Before the introduction of suspension laryngoscopy, he had attempted the removal of multiple papillomata from the trachea through a tracheotomy wound, and had found how difficult it was to do anything with precision without a view of the growths.

**Epithelioma of the Right Half of the Fauces treated by Diathermy** — Sir JAMES DUNDAS-GRANT, K.B.E., M.D. — Male (previously shown on 30th June\*), complained of great pain shooting up to the right ear, worse at night, and of increasing difficulty in swallowing. A "cauliflower" growth occupied the right anterior and posterior pillars, most marked on the posterior pillar, where the hardness on palpation was very considerable; there was an extensive area of congestion on the right half of the soft palate. Diathermy in July, with subsidence of symptoms. In this, as in several other similar cases, there was a history of excessive smoking of strong tobacco, the disease developing on the side of the pharynx opposite to that in which the pipe was held.

\* See *Journal of Laryngology*, 1922, p. 568.

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Dr DAN M'KENZIE, commenting on the remark in the notes about excessive smoking, said that he had tested his own mouth during smoking, with a thermometer in the line of the tobacco smoke, but to his surprise the mercury did not rise above 96° F., so that if tobacco-smoking was ever the cause of cancer, the exciting agent must be the nicotine and not the heat.

**Laryngectomy following Thyro-fissure**—C. A. S. RIDOUT, M.S.—Male, aged 51, first seen in February 1922, complaining of hoarseness and loss of voice for two months.

On examination the upper surface of an ulcerated growth of the left vocal cord was seen, extending to and just involving the left false cord. Movements of both sides of glottis unimpaired. Laryngofissure, 14th February 1922, when a much larger mass on the left side than seemed probable from previous examination, was found penetrating below the glottis. The growth was widely removed by subperichondrial resection, and it was believed that a clear margin free from growth was obtained. No cartilage was removed.

In July 1922, a warty granulation appeared at the site of a stitch sinus, and ulceration on the interior of the left thyroid ala could be seen with the laryngoscope. Laryngectomy was performed 29th August, tracheotomy having been carried out ten days previously. The operation of laryngectomy was rendered very difficult by:—(1) Scarring of previous tracheotomy in February; (2) the presence of extruding granulations in the site of the old wound; (3) the short, thick neck of the patient.

It was found impossible to bring the severed end of the trachea up to the skin. The left ala of the thyroid was found much involved in growth which had penetrated it, and was already involving muscles on the thyroid surface. A wide clearance of these structures was therefore made. After-progress uneventful.

Pathological report of tumour: squamous-celled carcinoma.

Dr P. WATSON-WILLIAMS said anyone who obtained such results as those of Mr Ridout was to be congratulated. It was erroneously assumed by some that a man who had undergone laryngectomy and left with no voice was, of necessity, miserable, but this man, who was really very cheerful, did not bear out such a view. If laryngectomy gave a patient a chance, he should have that chance, and the view that life was not worth living without a voice should be discouraged.

Mr RIDOUT (in reply) said that he had received several hints from members as to making the man's life more comfortable by enabling him to speak, and he hoped later to try one or more of them.

**Carcinomatous Larynx removed by Laryngectomy**—C. A. S. RIDOUT, M.S.—Female, aged 60, seen 9th September 1921, with marked dyspnoea. Examination revealed extensive intralaryngeal growth with fixation of all structures on right side of larynx. Patient,

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a very nervous woman, was advised to undergo early operation, and laryngectomy was performed on 11th September, preceded immediately by tracheotomy owing to breathing becoming seriously embarrassed on administration of anæsthetic. Patient's after-progress was most satisfactory, and she is alive and well at the present time, one year after operation. Microscope revealed a squamous-celled carcinoma.

**Parts removed Post-mortem in a Case of Tracheal Obstruction** \*—C. A. S. RIDOUT, M.S.—The specimen was obtained at autopsy from a boy, aged 16, who suffered from dyspnœa, and died from septic pneumonia. The notes of the case were discussed on 2nd December 1921.

The specimen shows marked enlargement of both lobes of the thyroid gland, together with enormous enlargement of the thymus, which consists of large discrete lobules clustering round the bronchi. Looked at casually the trachea and bronchi appear very slightly if at all abnormal, but on examination of the cartilaginous rings of the trachea and bronchi it is found that instead of the cartilage forming two-thirds of a circle, in reality it only exists in the anterior one-third; this evidently gave rise to the extreme flattening from side to side found at operation. The condition is not confined to any one portion of the trachea and bronchi, but is practically the same throughout. Thyroid, weight 147.5 gram., showed great enlargement in all dimensions. Microscopically, enlargement of vesicles and excess of colloid material. Thymus enlarged in all dimensions, divided into three lobes. Microscopically, showed absence of normal number of Hassall's corpuscles, particularly in the section of the median lobe. Suprarenal: normal size, no microscopical abnormality.

Mr CHARLES A. PARKER (President) said the specimen showed that the dyspnœa during life was probably due to pressure on a malformed trachea, but the question whether the deficiency in the tracheal rings was due to a congenital defect or to an arrest of development after typhoid fever still remains unsettled.

Mr G. W. DAWSON said he had seen several cases in which a thyroid tumour pressing on the trachea had caused atrophy of the rings of the trachea. On taking a deep inspiration, the trachea was sucked in, so that in most cases it was advisable to employ intratracheal ether.

Sir JAMES DUNDAS-GRANT asked whether, after the removal of the pressure from the trachea in these cases of "scabbard" trachea, the trachea ever recovered a circular form? He thought not.

Dr IRWIN MOORE said he had discussed the specimen with Professor Shattock, who had concluded that the want of cartilage was due to atrophy from pressure of the enlarged thyroid and thymus glands. Mr Ridout had

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\* See *Journal of Laryngology*, 1922, p. 147.

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presented the specimen to the Museum of the Royal College of Surgeons, and he (Dr Irwin Moore) hoped to receive a report later from Professor Shattock for publication in the *Proceedings*.

Mr RIDOUT (in reply) said that the post-mortem appearance was very different from that seen during life when he performed tracheotomy. In the former case the trachea was collapsed, like a piece of flaccid rubber, whereas during life its lumen appeared to be much smaller than its actual size. The thymus gland, as seen in the specimen, was enormously enlarged, and the abnormality of the tracheal rings extended to the bronchi. There were some enlarged bronchial glands below the thymus.

**Lipoma of the Larynx removed by Operation**—A. J. M. WRIGHT, F.R.C.S.—Growth removed from right ary-epiglottic fold of a male, aged 45, under general anæsthetic and suspension laryngoscopy. Symptoms had been present for five years or more, and consisted only of a feeling of dryness and discomfort in the throat and thickness in speech.

**Submucous Lipoma in the Glosso-epiglottic Furrows**\*—T. B. LAYTON, D.S.O., M.S.—Removed, after death, from a man, aged 76, who, after entering a restaurant, made an incoherent noise and a motion with his hand, which was construed as being a request for water, and then suddenly fell dead.

Mr J. F. O'MALLEY, referring to the rarity of lipomata of the larynx, said that when he looked up the literature a few years ago he could find records of only thirteen cases. Various tumours grew at the lower part of the pharynx and base of the tongue which were not entitled to be classed among lipomata of the larynx, as the latter usually grew in the ary-epiglottidean fold. In a case of his own the patient had at times very distressing dyspnœa on undue exertion. The lipoma could be seen dropping down between the vocal cords and acting as a ball-valve. If it had been allowed to remain there much longer the patient might have been suffocated.

Dr IRWIN MOORE reminded members of a contribution on this subject published in the *Proceedings of the Section of Pathology*, by Professor Shattock,† on a large lipoma of the glottis and base of the tongue. Dr Irwin Moore also showed a specimen of lipoma of the larynx which was removed by Mr Hunter Tod and shown at the meeting of the section, 7th December 1917.

Mr E. M. WOODMAN asked for opinions as to the reason why these patients with respiratory obstruction died so quickly. Ten days ago, a patient was having four teeth extracted in a Birmingham dental surgery

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\* Specimen No. 1271.1, from the Royal College of Surgeons.

† "Large Laryngeal Lipoma of the Glottis and Base of the Tongue, with a collection of examples of Submucous Lipomata of the Intestines and of the Larynx." *Proc. Roy. Soc. Med.*, 1909, ii. (*Path. Sect.*), pp. 285-296.

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and suddenly died. Strychnine and ether were administered, the abdomen quickly opened, and the heart massaged, without avail. At autopsy a small mop was found tightly wedged in the trachea. If this had been suspected, other steps would have been taken. Was the sudden death due to fright, to shock, or what?

Mr T. JEFFERSON FAULDER thought that on account of the rarity of lipomata, all specimens should be recorded. He had had a case of lipoma of the retropharyngeal space, which was more than 6 in. long, and it had been mistaken, previous to operation, for a retropharyngeal abscess. It was removed through the posterior triangle of the neck.

Mr A. J. M. WRIGHT (in reply) said that notwithstanding the size of the specimen, in his case no dyspnoea was present and the symptoms were trivial. The tumour was very easily removed.

**Papilloma of Septum Nasi**—H. LAWSON WHALE, F.R.C.S.—The tumour, the size of a man's thumb-nail, was removed from the cartilaginous part of the septum of a male, aged 46.

**Tuberculosis of the Larynx, with Demonstration of Instrument for Sunlight Treatment**—Sir JAMES DUNDAS-GRANT, K.B.E., M.D.—Male, aged 58, in June 1920, suffered from hoarseness and cough, and loss of voice of seven weeks' duration. An elongated swelling of the posterior half of the right vocal cord was seen, on which was a shallow ulceration, while the opposite vocal process was in a pachydermic condition. Tubercle bacilli were present. The galvano-cautery was applied to the right vocal cord.

Patient has since been in the south of France, and for the last three weeks he had been having sun-treatment by means of a metallic laryngeal mirror held in a frame devised by Dr Kowler of Mentone.

On 17th October last, the right vocal cord appeared nearly normal, but on subsequent inspection a small slit was detected on the upper surface and a slight degree of pachydermia of the left vocal process. The patient appears to be in perfect health.

**Ulceration of the Palate and Fauces**—W. H. KELSON, M.D., and W. H. THORNHILL, M.D.—Male, aged 64, was first seen a year ago, complaining of swelling and congestion of the palate and fauces; ulceration of the soft palate and uvula was observed in June. The uvula has now disappeared. No membrane was present and there was no pain. Liquids sometimes passed through the nose and occasionally food was regurgitated, but œsophagoscopy revealed nothing abnormal. In appearance the condition resembled epithelioma, but portions removed for examination failed to confirm this. There is no history of syphilis and Wassermann's reaction is distinctly negative: slight enlargement of the cervical glands can be detected; von Pirquet's test negative.



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Mr TILLEY had no doubt that this was a malignant condition.

Mr CHARLES A. PARKER (President) said it would be well to hear the result of further investigation. He thought it was chronic tuberculosis or lupus.

Dr W. H. KELSON replied that he did not agree with Mr Tilley's view ; the sections, exhibited in the room, showed no epithelial growth at all. It was very slow and painless, and looked like lupus.

*Report on the Microscopic Section by Professor S. G. Shattock, F.R.S.—*  
“The lesion is a chronic inflammatory one, showing proliferation of connective tissue cells, accompanied by the presence of plasma-cells and lymphocytes, without polymorphs. It contains no giant cells. A section will be stained for tubercle bacilli, and the result will be reported later.”

## **Myeloid Sarcoma of the Posterior Pillar of the Fauces—**

NORMAN PATTERSON, F.R.C.S. — Male, aged 50, four years ago noticed a small swelling on the right side of the neck, movable but not painful. He could manipulate it and cause its disappearance for a few days. Latterly he has noticed that fluid escapes from his nose after drinking, if he holds his head forward. He also commenced to spit up a little blood in the morning. For some time he has noticed a discharge coming into the throat in the morning. He has lately been losing weight. When first seen, a few weeks ago, a large, soft, freely movable tumour, of a reddish-blue colour, and somewhat irregular surface, was observed growing from the neighbourhood of the right posterior faucial pillar, and the teeth were in a very septic state. On 14th October the teeth were extracted, and a portion of the tumour was removed for microscopic examination. Report: A myeloid sarcoma.

## ABSTRACTS

### EAR.

#### *Treatment of Circulatory Affections of the Ear with Panitrin.*

FRIEDRICH SCHWERTFEGER. (*Archiv für Ohren-, Nasen- und Kehlkopfheilkunde*, Bd. 109, H. 4, July 1922.)

Panitrin is a solution of papaverine nitrite in dia-ethyl acetamide, a compound for which remarkable results are claimed in the treatment of circulatory affections of the organ of hearing. Injected subperiosteally behind the ear, or, subcutaneously, in doses varying from 0.1 to 1.0 c.c. according to age, at intervals of three or four days, no ill effects have been observed in the course of 1000 injections. The drug acts selectively on blood-vessels constricted by disease.

Among the aural indications for its use are the following. It has a beneficial influence in inherited lues, and in senile deafness the improvement in hearing is especially prompt and permanent, with consequent betterment of the psychical and physical state. Deafness in women during the puerperium and allied conditions is also benefited. Panitrin is useful in the treatment of chronic eczema of the meatus. Otosclerosis continues, as from time immemorial, to defy almost any form of treatment, but panitrin is singularly effective in relieving the tinnitus, which is such a distressing feature of the disease.

The general indications are numerous. Schwerdtfeger asserts that 90 per cent. of cases of habitual headache yield to panitrin: practically all forms of headache—febrile, anæmic, luetic, neuralgic, arteriosclerotic, etc.—being benefited. The exhibition of panitrin is also advised in miscellaneous conditions such as asthma, chronic rhinitis, (simple and atrophic), and facial paralysis.

W. OLIVER LODGE.

#### *An Attempt to Interpret Paracusis Willisii.* By E. ESCAT, Toulouse. (*L'Oto-Rhino-Laryngologie Internationale*, March 1922.)

The writer states his inability to accept the current theories regarding this phenomenon. In his opinion, the hyperacusia in question is relative, not absolute, and he gives three reasons for his statement:—1. He quotes the instance of a deaf person subject to this condition, travelling in a train with a companion who hears normally. In conversation with the former, the latter is obliged to raise his voice on account of the surrounding noise. This noise is,

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generally speaking, of a low pitch, and therefore the speaker finds it necessary not only to speak more loudly but also to raise the pitch of his voice. 2. On the other hand, the deaf person, being always deaf in his lower tones, escapes the confusion of sound which afflicts his friend. 3. He is therefore able to appreciate more easily the raised tones of the conversation.

Without deafness in the low tones, there is no paracusis. Where one ear only is affected, this symptom is not present, because the healthy ear picks up the low tones of the surrounding noise, and the hyperacusis of the diseased ear is thus discounted.

Escat, having had occasion to travel by train with a friend who suffered from advanced deafness, was able to carry out the following investigations. With the train at rest or in motion, the watch could be heard by bone conduction all over the patient's skull. By air conduction, it was heard in the left ear at 3 mm., in the right at 1 mm., with the train at rest. During the journey, these measurements dropped considerably. The patient heard conversational voice only with difficulty when the train stopped, but the train having started, the conversation was followed with ease. The train stopped at the stations abruptly enough to surprise Escat with his voice raised much above the normal, and at each stop, lowering of the voice was followed by the disappearance of the hyperacusis. In the belief that the paradox was caused by deficient air conduction of the lower notes, bone conduction was utilised to convey the rumble of the train. This was done by resting the patient's chin on the handle of a cane, the point of which rested on the floor of the carriage, and later, by resting the head against the wall of the carriage. This position at once negated the hyperacusis by conveying the noise of the train to the patient's cochleæ, rendering efforts at conversation of the utmost difficulty. In the same position the watch could not be heard either by air or bone conduction.

The conclusion is come to that the phenomenon is caused by the loss of appreciation of the lower tones by air conduction.

GAVIN YOUNG.

*Occupational Deafness in Vineyard Workers.* Dr GIRON, of Carcassone. (*L'Oto-Rhino-Laryngologie Internationale*, April 1922.)

Occupational deafness from exhaustion of the auditory nerve, caused by constant exposure to loud sound, is well enough known in town life. It is exceptional to find it in the country.

A certain class of Giron's patients refused to divulge the cause of their deafness. It was not syphilis, nor mumps, nor typhoid. They were usually men of between 40 and 45, who worked in the vineyards, and by reason of their deafness were excused war-

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service. At length a remorseful land-steward revealed the source of the deafness. In the vine-country, in order to combat the ravages of certain larvæ, the stems and branches of the vines are scalded with boiling water. The water is boiled in small kettles provided with steam exhausts fitted with whistles. While work is in progress, the noise from these kettles is continuous. To obviate this unfortunate complication, Giron suggests a whistle with lower tone or a gauge with a dial.

GAVIN YOUNG.

*On the Transmission of Sound by Bone, a New Method of measuring it and a New Formula for Rinne's Test.* G. GRADENIGO. (*Archiv. Néerlandaises de Physiologie de l'homme et des animaux*, Tome vii., p. 51, 1922.)

The author divides conduction by bone into osseous conduction proper, across the bones of the skull directly to the internal ear and the auditory nerve, and osteo-tympanic conduction by the bones forming the walls of the external auditory meatus, by the tympanic apparatus and the labyrinthine windows to the internal ear. The latter is a much more delicate and accurate means of conduction, and is best demonstrated in the zone corresponding to the anterior wall of the external auditory meatus, *i.e.*, the tragus. It is affected by disease of the middle ear.

The author has devised an instrument—the osteo-tympanic acoumeter—which consists of an electro-magnet and a vibrating hammer, the sound of which can be regulated and is not conducted by air. The acoumeter is used for investigating the two types of osseous conduction, the intensity of the sound being regulated by moving the hammer about a graduated scale.

Both these types of conduction, as well as aerial conduction, are employed in the case of the telephone, and the author puts the ratio between the perception when the receiver is in contact with the calvarium and when it is held close to the meatus as 1:30. He has elaborated Rinne's test as follows:—

Bone conduction	.	.	.	.	(m)	+
Osteo-tympanic conduction	.	.	.	.	(tr)	++
Aerial conduction	.	.	.	.	(a)	+++
In slight middle ear disease	.	.	.	.	$\left\{ \begin{array}{l} (m) \\ (a) \\ (tr) \end{array} \right.$	$\left\{ \begin{array}{l} + \\ ++ \\ +++ \end{array} \right.$
In advanced middle ear disease	.	.	.	.	$\left\{ \begin{array}{l} (a) \\ (tr) \\ (m) \end{array} \right.$	$\left\{ \begin{array}{l} + \\ ++ \\ +++ \end{array} \right.$

F. C. ORMEROD.

## Ear

### *A Pendular Electro-magnetic Alternator for Precise Clinical Acoumetry.*

A. STEFANINI. (*Archiv. Neerlandaises de Physiologie de l'homme et des animaux*, Tome vii., p. 64, 1922.)

The author has constructed an acoumeter which consists of a specially wound electro-magnet and a grooved plate of iron which is fixed to a pendulum that swings above the electro-magnet. Round one arm of the horse-shoe magnet are wound separate series of 1, 2, 3, 4, 10, 10, 50, 100, 100, and 200 turns of wire, and round the other arm a series of 500 turns of wire.

The heads of all these different series are led to blocks in a circuit, so that by inserting keys between the blocks any or all of the coils could be shut out of the circuit, as in a Post Office resistance box. There are two extra resistances in the circuit which is completed by a telephone ear-piece.

The note and intensity of the sound in the telephone can be regulated by (i.) varying the angle through which the pendulum is allowed to swing; (ii.) the inclusion of one, both, or neither of the extra resistances; and (iii.) the variable inclusion of the several series of coils in the winding of the electro-magnet.

The author claims that with this instrument he is able to produce a constant and known sound by suitably adjusting the component parts of the apparatus.

F. C. ORMEROD.

### *A Labyrinthine Poison (Paraphenylenediamine) in Certain Hair Dyes.*

Dr P. LAURENS, Paris. (*Bulletin d'Oto-Rhino-Laryngologie*, July 1922.)

Laurens gives details of eighteen cases of poisoning following dyeing the hair with "vegetable" dyes of which this substance was the basis: in certain circumstances quinonediimine is produced, and this is very toxic. All the cases appear as obscure labyrinthine disorders. Three classes are described:—

(1) The acute: intense vertigo, headache, etc., of short duration, after each application of the dye.

(2) "Otosclerosis": more or less typical, coinciding with the period during which the dye is used, and clearing up on its discontinuance. Deafness and tinnitus are marked as well as vertigo.

(3) Cases with labyrinthine and auditory symptoms, often ill defined, but with definite general arterio-sclerosis, thyroid disturbance, etc. The author emphasises the importance of remembering this possibility in obscure cases.

E. WATSON-WILLIAMS.

# Abstracts

*Contributions to the Pharmacology of Body Attitude and Labyrinth Reflexes.* 1. Introduction by R. MAGNUS; 2. Strychnine, and 3. Picrotoxin, by D. J. JONKHOFF. (*Acta Oto-Laryngologica*, Vol. iv., fasc. 1, 2, and 3, 1922.)

The first of these articles consists of a review of the various reflexes which are involved in the maintenance and automatic alteration of the attitude of the body, and the methods of testing them. These reflexes include both those of labyrinthine origin and also a series of others which are not dependent on the labyrinth, such as the various tonic reflexes of the neck on the limb and eye muscles, and the body attitude on the head, etc. They have been very thoroughly investigated during the past ten years in the Pharmacological Institute of Utrecht, and have, at any rate in all essentials, been so far accurately determined as to render useful an investigation of the effects of various poisons on these reflex mechanisms.

In the second article Dr Jonkhoff proceeds to deal with the effects of strychnine. He shows that (1) even very small doses (e.g.  $\frac{1}{100}$  to  $\frac{1}{50}$  mg. to the kilogram of body weight) produce an increase of all labyrinth reflexes excepting the reactions to progressive movements. (2) As the dose is increased the head and eye nystagmus cease at a point where the head and eye turning reactions are still present, and under certain conditions very active. (3) The attitude reflexes disappear with the onset of general convulsions. (4) The compensatory eye movements are the most resistant of all the labyrinth reflexes to strychnine poisoning. They persist up to the end. (5) In the convulsion stage of strychnine poisoning the reciprocal innervation of the muscles involved in the neck and labyrinth reflexes on the body musculature, and the caloric labyrinth reflexes on the eye muscles, remain undiminished. (6) In the convulsion stage also, the caloric labyrinth reflex on the eyes shows a great prolongation of the normal deviation, persisting for several minutes. These examples show how remarkably selective may be the action of a poison on the mechanism controlling the body attitude and the labyrinth reflexes.

The third article (also by Dr Jonkhoff) deals with the effects of intravenous injection of picrotoxin. Small doses (e.g.  $\frac{1}{20}$  mg. to the kilogram of body weight) produce a definite and extraordinarily long persisting increase of labyrinth reflexes in the absence of any other symptoms. Larger doses (1 to 2 mg. per kilogram) result in paralysis of the labyrinth reflexes, the head turning reaction and after-reaction being the last to disappear and sometimes remaining till death. The compensatory eye movements, which in strychnine poisoning remain undiminished till death, in picrotoxin poisoning are lost at a comparatively early stage. Picrotoxin poisoning alters entirely the ordinary picture of the decerebrated animal. In place of the characteristic

## Ear

extensor tonus of the extremities, neck and trunk, there appears a marked flexor tonus, while in like manner the convulsions affect chiefly the flexor groups of muscles. Picrotoxin therefore gives rise, like strychnine, to quite definite and characteristic alterations of the reflexes under consideration.

THOMAS GUTHRIE.

### *Method and Clinical Use of the Galvanic Tests for the Labyrinth.*

By Dr I. JÜNGER. (*Monats. f. Ohrenh.*, Year 56, No. 6, 1922.)

Disagreeing with certain statements by other observers to the effect that this test is of no clinical value, and as a rule unnecessary and painful, the author gives a description of his own experience, based on the examination of thirty normal people and fifty patients suffering with various forms of labyrinth disease.

One of the prime advantages he claims for this method is that it enables us to differentiate between disease of the sense organ and of the nerves; since the galvanic current does not affect the sense organ, but is dependent for its reaction on the integrity of the nerve apparatus, and further, that by this test a pure unilateral stimulus can be employed.

The following account is given of Brunner's experiment:—A "divided" anode is applied to the tragus of each ear (the negative pole being secured presumably at any other convenient part of the body). One ear is then irrigated with 5 c.c. of cold water, which results in a nystagmus to the opposite side of a character identical with the normal caloric test, but of a longer duration. On the other hand, if the ear is irrigated with hot water, either no nystagmus is induced to the same side, or it will only appear after prolonged irrigation. Should, however, a "divided" kathode be applied to the tragus of each ear, exactly the opposite effects will be produced by irrigation.

From this, Brunner concludes it is possible to stimulate one labyrinth alone by the galvanic current, and, secondly, that the anodal effect does not result from the arrest of the labyrinth function, but that the anode as well as the kathode are dependent for their effects on the *nerve* apparatus.

In his investigations the author has adopted the usual method of applying the anode to one tragus and the kathode to the other, and noting the character of the induced nystagmus, the falling reaction, pointing reaction, the arm-tonus reaction (as lately described by Fischer and Wodak), and the subjective sensations. As a rule he found that the nystagmus appeared before the falling reaction.

As regards normal persons, 3 milliamps were usually sufficient to induce nystagmus, whilst it was of interest to note that weaker currents (under 2 milliamps) would give rise to a "periodical" nystagmus.

## Abstracts

Inclination of the head, which was always towards the side of the anode, did not occur until after the current was raised to between 3 and 5 milliamps. As a rule nystagmus was observed before the falling reaction, but the falling reaction appeared first, if, instead of the Romberg position, a modification of this, as recommended by Mann, was adopted. This modification consists in making the patient stand with one foot directly in front of the other. The direction of the falling reaction (constantly towards the side of the anode) was found to be in normal persons, at any rate, quite independent of alteration in the position of the head.

Under his reference to these tests in cases of various labyrinth disease, of which fifty were examined, and of which a detailed account is given, one of the most interesting notes is to the effect that the functional integrity of the vestibular apparatus in deaf-mutism does not necessarily indicate congenital syphilis as the causal factor, since the writer also found the same condition in cases of "hereditary-degenerative" deaf-mutism.

A full description of the results of his examination of a case of "comotio-cerebri" completes a most valuable article.

His conclusions are summarised as follows:—

1. It is possible to investigate the condition of one labyrinth alone by the galvanic test.
2. In normal people the nystagmus, on looking in the direction of the quick component, is produced with 3 milliamps.
3. Inclination of the body, which is constantly towards the side of the anode, occurs usually with 3 to 5 milliamps in normal people in the sitting position.
4. The falling reaction is induced before the nystagmus, in patients standing in Mann's position.
5. In cases of labyrinth disease, and in patients whose labyrinth is destroyed, it is recommended to test the falling reaction by making them stand with the heel of one foot against the toe of the other.
6. In normal persons the typical dependence of the falling reaction on the position of the head as a rule was not demonstrable. In a considerable number of cases, however, the falling tendency was inhibited by an abnormal position of the head.
7. Normal people usually describe a feeling of dizziness, rather than any sensation of rotation, under the galvanic test.
8. In normal people the typical pointing reaction, as well as the "arm-tonus" reaction (of Fischer and Wodak), is seldom seen.
9. In certain diseases of the labyrinth no nystagmus is induced by a strong current, although the typical falling reaction



# Peroral Endoscopy

occurs. The explanation of this phenomenon must be postponed till our knowledge of the trunk and eye musculature has been further investigated.

10. In some cases of deaf-mutism (non-syphilitic) the galvanic test gives a positive reaction, although no effect can be produced by the caloric or rotation tests; a condition however which, up till now, has been held as diagnostic of congenital syphilitic disease.
11. Lack of response to the caloric and rotation tests, combined with galvanic excitability, indicates a destruction of the labyrinth end-organs, but does not afford any conclusion as to the anatomical condition of the nervous apparatus of the inner ear.
12. Just as cases of hereditary-degenerative deaf-mutism, as well as cases of congenital syphilitic disease of the inner ear, show a varying anatomical picture, so the functional condition of the labyrinth must also vary in consequence.
13. The galvanic test enables a hyper-sensibility of the labyrinth to be determined, but does not afford an indication of labyrinth hypo-excitability.
14. A hyper-sensibility of the labyrinth is shown by the occurrence of nystagmus and giddiness, on looking in the direction of the quick component with a current of under 3 milliamps, or by similar phenomena on looking directly forwards with a current of under 5 milliamps.
15. The occurrence of severe vasomotor phenomena, under the galvanic test, points to a general neurasthenic condition, and not to a labyrinthine hyper-sensibility.

ALEX. R. TWEEDIE.

## PERORAL ENDOSCOPY.

*A Pedunculated Lipoma of the Œsophagus.* PORTER P. VINSON M.D., Rochester, Minn. (*Jour. Amer. Med. Assoc.*, Vol. lxxviii., 11, 18th March 1922.)

S. V. J., aged 62, gave a history of having coughed into his mouth an elongated piece of flesh which was thought to be a growth attached to the uvula. The growth was easily swallowed, but his throat felt sore and swollen for several days.

He had no further trouble for six years, when following a heavy meal he became nauseated, and in vomiting ejected a piece of tissue long enough to protrude into his mouth. He tried to bite it off, but lack of teeth prevented him, and he again swallowed the tumour. His throat felt uncomfortable, and his breath was very offensive for a few

## Abstracts

days. Three weeks later a similar occurrence took place. At no time was there any dysphagia.

Oesophagosopic examination revealed a tumour just below the introitus, attached to the right wall of the gullet by a pedicle three-eighths of an inch in diameter.

No attempt was made to pull the tumour out of the mouth at this examination, but following breakfast a week later, vomiting was induced and the tumour again regurgitated. It extended  $4\frac{1}{2}$  inches beyond the incisor teeth, and the tip measured  $2\frac{9}{16}$  inches in circumference, gradually tapering to the base. It was rather firm and covered with normal mucous membrane, except for a small ulcerated area near the tip.

Under local anæsthesia, the tumour was removed through an external incision in the neck. The raw surface left by the severed base was closed with normal mucous membrane. A small drain was inserted which was removed in seventy-two hours, and the neck healed without infection. The length of the tumour after removal was found to be  $8\frac{3}{4}$  inches, and section showed it to be a simple lipoma.

In a search of the literature, Vinson has been unable to find a similar case. Excellent illustrations accompany the paper.

PERRY GOLDSMITH.

*Removal of Paper Fastener by direct Peroral Bronchoscopy.* HERBERT TILLEY, B.S., F.R.C.S. (*Brit. Med. Journ.*, 19th November 1922.)

The foreign body had been impacted for twenty-one months in the left bronchus—had caused fits of coughing and chest symptoms from the beginning, but an unsuccessful X-ray examination eight weeks after the first attack allayed the early suspicions of the true cause of the disturbance.

Attacks of pyrexia occurred every two or three weeks—the tonsils were removed as being possibly responsible for the bronchitis, and even the removal of the appendix was discussed.

At the end of twenty months, however, a more expert radiographer demonstrated a metal paper fastener in the left bronchus, lying with clips fully spread and pointing upwards.

This was removed under general anæsthesia, the chief difficulty experienced being hæmorrhage from granulations surrounding the foreign body.

T. RITCHIE RODGER.

*Additional Experimental Studies in Bronchial Function.* J. G. H. BULLOWA and C. GOTTLIEB. (*Laryngoscope*, Vol. xxxii, p. 284.)

In a previous paper the authors, by injecting radio-opaque substances into the bronchi of dogs, observed that the lungs emptied

## Peroral Endoscopy

themselves by a bellows-like action of the trachea and bronchi, and also demonstrated a peristaltic wave of the bronchial muscles.

In the present series, by introducing opaque capsules, foreign bodies, barium in oil, etc., the trachea and bronchi were kept under observation. Without cough the dogs were able to get rid of the foreign bodies in remarkably short periods. Attempts to produce a stricture by placing obstacles proved unsuccessful; therefore, in the next series of experiments, the bronchial walls were cauterised. When the dog had recovered from the immediate effects of the traumatism, an injection of barium in oil might remain in the bronchus for months. On examining the lungs, the terminal alveoli showed thickening of the walls and were filled with barium. The cauterised bronchus was denuded of epithelium.

ANDREW CAMPBELL.

*Simple Treatment of Cardiospasm.* J. OEHLER. (*Münch. Med. Wochenschrift*, Nr. 42, Jahr 69.)

Having confirmed the existence of spasm by passing a stomach tube, Oehler keeps the patient in hospital for a few days until the latter has learnt to overcome the resistance and to pass the tube into his own stomach. The patient is then discharged from hospital, taking his stomach tube with him, and instructed to pass it at lengthening intervals as required.

JAMES B. HORGAN.

*Local Spasm of the Esophagus and Impairment of Deglutition following Local Injury of the Pharyngeal and Esophageal Mucosa.* A. J. CARLSON, M.D., Chicago. (*Jour. Amer. Med. Assoc.*, 18th March 1922, Vol. lxxviii., 11.)

The patient, while working on a problem in physiological chemistry, received a boiling concentrated solution of sodium hydroxide in the back of the throat, without it having touched the lips or anterior part of the tongue. Within five minutes the throat was swabbed with dilute acetic acid, but five minutes later he was unable to swallow. Marked œdema of the epiglottis and ventricular bands took place twenty minutes later. Deglutition was impossible for five days, and when in a small degree restored, it was found that about one-third of the epiglottis had sloughed. Body weight was reduced 20 per cent. in six weeks. As only fluids could now be swallowed, the œsophagus was dilated after the method of Sippy and was eventually followed by normal swallowing.

PERRY GOLDSMITH.

## REVIEWS OF BOOKS

*Oto-Rhino-Laryngology.* GEORGE LAURENS, translated by H. Clayton Fox. Second Edition. Pp. 135. Bristol: John Wright & Sons, Ltd. Price 17s. 6d. net.

We are pleased to see a second edition in English of this excellent little work.

The translation by Mr H. Clayton Fox is, as before, well done and free from any personal intrusions of opinion on the part of the translator.

The present work is from the fourth French edition, and has preserved its essentially practical character.

The text has been revised, with condensation in some directions and extension in others. Certain new matter has been added, as examples we may mention Vincent's angina, hay fever, pseudo-hæmoptysis of laryngeal origin, and vaccine therapy.

We note here and there changes in technic from the early edition, such as discarding the formal incision through the palate in opening a peritonsillar abscess in favour of a blunt perforation between the pillars.

The illustrations, of which there are close on 600, are very helpful, and much may be learned from them alone, especially as the appropriate one is always at hand, and not, as in many books, in the next chapter. There is a full and concise index.

J. D. LITHGOW.

*Dispensing Made Easy.* WM. G. SUTHERLAND, M.B. Aberd., revised by A. L. Taylor, Ph.C., M.P.S. Fifth Edition.

This book, revised and brought into line with the 1914 edition of the *British Pharmacopœia*, is written for the dispensing medical practitioner. It contains many useful practical hints and details of a number of convenient stock dispensary formulæ. The book is of handy size. The writer throughout adheres strictly to the task which he has set himself—to demonstrate to the busy practitioner methods which will ensure that his dispensing is rapid, accurate, and economical.

J. M. DARLING.

## Reviews of Books

*Suggestion and Common Sense.* R. ALLAN BENNETT, M.D. Lond.,  
M.R.C.P. Pp. 105. Bristol: John Wright & Sons, Ltd. Price  
6s. net.

Twenty years ago, on the advice of the late Dr Mercier, Dr Bennett decided to "shun psychology and cling to that which is good." Notwithstanding this attitude of independence, the first two chapters of the book are devoted to "Psychology and Organic Life" and "Psychology and Disease" respectively. The remainder of the book deals with suggestion and its practical applications in the treatment of disease.

The author's attitude towards psycho-analysis may be summed up in the following sentence (p. 86): "Patients whose condition requires such a remedy are better left untreated, better in a mental hospital, better dead."

H. T. THOMSON.

## LETTER TO THE EDITORS

TO THE EDITORS,

*The Journal of Laryngology.*

SIRS, — I am tempted to contribute to the discussion in your columns on the Blood-Clot Treatment of Simple Mastoidectomy.

Since I had the privilege, three years ago, of observing Mr Tilley's methods at University College Hospital, I have followed them consistently in my own hospital and private practice.

As a rule, healing has been complete within a week, painful dressings are eliminated, and the saving in hospital expenditure is considerable.

As Dr Dan M'Kenzie points out in his letter, there still remains the septic middle-ear, but the risk of reinfection from this source may be minimised by free incision of the tympanic membrane and thorough cleansing at the time of operation.

Dr Macnab expresses the opinion generally held when he states that he has been dissatisfied with the original blood-clot method, and it would appear that the new method owes its success to B.I.P.P. rather than to blood-clot.

Dr MacGibbon of Christchurch, N.Z., who opened this discussion, is therefore perfectly just in his condemnatory criticism of the blood-clot method *per se*.

It is certain, however, that anyone who follows the technique described by Mr Tilley will be agreeably surprised by the excellent results.—I am, yours, etc.,

DOUGLAS GUTHRIE.

EDINBURGH.

## GENERAL NOTES

ROYAL SOCIETY OF MEDICINE,

1 Wimpole Street, London, W.1.

*Section of Laryngology*—President, Charles A. Parker, F.R.C.S.Ed. Hon. Secretaries, T. B. Layton, D.S.O., M.S., and J. F. O'Malley, F.R.C.S. The next Meeting of the Section will be held on Friday, 2nd March, at 4.45 P.M.

Members intending to show cases or specimens are requested to give notice of the same to the Hon. Senior Secretary, Mr T. B. Layton, 10 Welbeck Street, London, W.1, at least twelve days before the date of the Meeting.

*Section of Otology*—President, Hunter F. Tod, F.R.C.S. Hon. Secretaries, F. J. Cleminson, M.Ch., and Archer Ryland, F.R.C.S. Ed. The next Meeting of the Section will be held on Friday, 16th February, at 5 P.M.

Members intending to show cases or specimens are requested to give notice of the same to the Hon. Senior Secretary, Mr F. J. Cleminson, 32 Harley Street, London, W.1, at least twelve days before the date of the Meeting.

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BRITISH MEDICAL ASSOCIATION, PORTSMOUTH, 1923.

The Ninety-first Annual Meeting of the British Medical Association will be held at Portsmouth in July, under the Presidency of Mr Charles P. Childe, F.R.C.S., Senior Surgeon of the Royal Portsmouth Hospital. The President will deliver his Address on the evening of Tuesday, 24th July, and the Sectional Meetings for scientific and clinical work will be held on the following days.

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At the Meeting of the Scottish Society of Otology and Laryngology held at the Western Infirmary, Glasgow, on 10th December, Dr R. P. Mathers, Dundee, was elected President for the ensuing year.

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Professor M. L. Torrini, 81 Via Cavour, Florence, Italy, would be much obliged to readers of the *Journal* if they would send him reprints or refer him to their publications upon "Otitic Pyæmia."

\* \* \*

THE LATE DR ALBERT H. BUCK.

We have been asked to publish the following obituary notice of Dr Albert H. Buck, the first President of the New York Otological Society, which has been prepared by Drs Robert Lewis and Edward B. Dench, and incorporated in the Minutes of the Society.

## General Notes

There are comparatively few perhaps, who read this brief sketch, who will recall a courteous, kindly gentleman, whose smile was reassuring and whose countenance instilled a confidence in the strength and will to give aid to one in need ; a scrupulously honest, lovable man—one of the grand old men of medicine—Dr Albert H. Buck, who has just passed on.

He was born in New York City, 20th October 1842, the son of Dr Gurdon Buck, one of America's noted surgeons. Switzerland, his mother's native country and where he received a part of his early education, remained throughout his life the Mecca to which all roads led, whenever it was feasible for him to travel. He was an Alumnus of Yale College, Class of 1864 ; of the College of Physicians and Surgeons, Class of 1867, and of the New York Hospital.

After his internship in New York Hospital he went abroad, and in Germany and Austria, under Politzer and others, devoted his entire time to the study of the ear and its diseases. After his return to New York City his indefatigable labours resulted in the early recognition of his ability and skill. He was made an Aural Surgeon in the New York Eye and Ear Infirmary in 1872, and after half a century death severed his connection with the Institution as Consulting Aural Surgeon. For a number of years he was Consulting Aurist to the Presbyterian Hospital ; Lecturer, and later, Professor of Otology in the College of Physicians and Surgeons, Medical Department of Columbia University. He was fourth President of the American Otological Society, being preceded in office by Drs Henry D. Noyes, D. B. St John Roosa, and Clarence J. Blake, and he was the first President of the New York Otological Society.

Dr Buck's literary tastes and linguistic knowledge were employed in the editing of the voluminous and epoch-making medical works of the American Edition of *Ziemssen's Cyclopaedia of the Practice of Medicine* (20 volumes), 1874 ; the *Reference Handbook of the Medical Sciences* (8 volumes), 1st Edition, 1887, 2nd Edition, 1900 ; the *American Practice of Surgery* (8 volumes), 1908 ; also the American Translation of Stricker's *Manual of Histology* (1 volume), 1872 ; and *Hygiene and Public Health* (2 volumes), 1879. These were distinct from his many contributions on otological problems in the medical journals. His work on *Diseases of the Ear* was peculiarly the individual results of his own observation and study : the 3rd and last edition was published in 1898.

After retiring from the practice of otology, his virile mind demanded occupation, and so, after much research in the libraries of this country and those abroad, Dr Buck gave to the world, in 1917, a most entertaining and instructive book, *The Growth of Medicine from the Earliest Times to about 1800* ; it was the first work published by the Yale University Press on the Williams Memorial Publication Fund, and, in 1920, in the seventy-eighth year of his life, he completed his labours with *The Dawn of Modern Medicine*, also published, under the auspices of the Williams Memorial Publication Fund, by the Yale Press.

His modesty and reticence were so marked that to many he was unknown, but fortunate were those who could claim the friendship of this true and lovable man. Many, many will be benefited because he lived and worked as befitted a man of science.

# General Notes

## THE ÓNODI COLLECTION.

For the convenience of those who may be desirous of studying the preparations which are now displayed in the upper gallery of Room II of the Museum of the Royal College of Surgeons, Mr Layton has prepared and tabulated short notes upon the general arrangement of the specimens. They have been conveniently arranged in seven groups. Each group illustrating definite anatomical regions, so that the student may, in this way, be able to concentrate his attention upon one particular aspect of the subject, and will not find it necessary to pass from one part of the gallery to another to complete his study of a definite region.

Thus, in one section, the nose and nasal cavities may be inspected independently of the accessory sinuses; another series illustrates the sinuses in childhood, commencing in foetal life and passing through the period of eruption of the temporary and permanent teeth up to adult life. The general relations of the sinuses to the surrounding cavities with their important contents, such as the cranial cavity, the orbit, the nasopharynx, and the auditory apparatus, comprise another group. In the remaining four, the individual sinuses are dealt with and their many varieties and relations illustrated.

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In the *American Journal of Röntgenology* for November 1922, Dr Charles F. Bowen of Columbus, Ohio, gives an interesting account of how he removed, in 1909, a tack from the bronchus of a child aged 12, without making use of the bronchoscope. Indeed, he tells the audience he is addressing, that although at that time he knew Chevalier Jackson by name, he had never heard of the bronchoscope. The case was one of supposed pulmonary tuberculosis, but on subjecting the chest to radiographic examination, the tack was discovered in one of the main bronchi. Tracheotomy was performed and the fluoroscope arranged. During this period, Bowen remained in an adjacent darkened room, and when the preparations had been completed and the lights in the operating theatre lowered, he entered; armed with a pair of forceps which he inserted through the tracheotomy wound, and under the guidance of the fluoroscope, he extracted the tack in less than fifteen seconds. Indeed, he accomplished his object before any of his assistants were aware of what had been done. He ascribed this to the fact that he alone had taken the necessary steps to accommodate his vision by a preliminary prolonged sojourn in a darkened room. At subsequent periods Bowen removed a number of foreign bodies from the œsophagus with forceps directed entirely with the aid of the fluoroscope.

\* \* \*

Dr Frithjof Leegaard has been nominated as Professor of Otology and Laryngology in the University of Christiania in succession to Professor Wilhelm Uchermann.



# The Journal of Laryngology and Otology

(Founded in 1887 by MORELL MACKENZIE and NORRIS WOLFENDEN)

## NEURO-OTOLOGICAL EXAMINATION IN ELEVEN VERIFIED CASES OF BRAIN TUMOUR.\*

By D. E. S. WISHART, B.A., M.B., Toronto, Assistant Surgeon,  
Department of Laryngology, Hospital for Sick Children, Toronto;  
Junior Demonstrator, Department of Oto-Laryngology, University  
of Toronto.

OWING to the desire of the Visiting Staff at the Massachusetts Charitable Eye and Ear Infirmary to find out how much real information could be discovered by otological examination in neurological cases exhibiting deafness, vertigo, staggering, or vomiting, the writer was given the opportunity, over a considerable period, of examining and reporting on all cases referred to the Infirmary for ear examination by various services at the Massachusetts General Hospital. In the sixteen months ending 1st February 1922, approximately one hundred such examinations were made.

The work was undertaken and pursued with considerable misgiving, for it is common knowledge that failures in neuro-otological diagnosis have completely discouraged many hopeful investigators. Many symptom complexes proved completely baffling. Some presented a clinical picture which permitted a diagnosis being made, but subsequent events produced neither proof nor disproof. Some encouragement was obtained from cases which responded favourably to treatment based on the diagnosis afforded by the otological examination. (When sufficient time has elapsed for several subsequent re-examinations, these cases will form the basis of another thesis.) The

\* From the Otological Clinic of the Massachusetts Charitable Eye and Ear Infirmary, Boston, Mass., U.S.A.

## D. E. S. Wishart

present paper is a report of all the cases which, to the best of the writer's knowledge, were examined by the writer, and which came to autopsy or operation. Clinical records of eight cases are given below in sufficiently complete detail to afford a guide to those otologists who are interested in this aspect of their specialty. For the sake of economy of space, the remaining cases are dismissed with only enough comment to indicate their type and character.

The Massachusetts General Hospital is justly proud of its case records; to pretend that the records below are full copies would be unjust to a great institution. A mass of record—historical, clinical, laboratory, bedside, consultational, and pathological—has been omitted; but everything deemed essential to a clear and true understanding of the cases has been given.

The object of this paper is not to give a clinical picture of certain types of brain tumour. Its aim is to give a truthful picture of the problem each case presented to the otologist; an exact statement of the examination, the report, the diagnosis, and the subsequent fate of the case. Careful reading will show that the mistakes have not been disguised.

### PART I.—INTRODUCTION

1. *The Otological Examinations* in each case are copies of the report made at the time. In the majority of cases a "summary" was made of the essential findings, and, under the heading "Impression," an attempt was made to express the logical deductions to be drawn from them in language intelligible not merely to an otologist but to the medical or surgical services which desired help from our report. In all save one of the cases the report was written by myself. In that instance (case of M. G. P.) the "Impression" only was sent to the ward and it was dictated by myself.

2. *Previous Ear Disease.*—Of the twelve cases eleven had no history or evidence of any middle-ear disease. One case (I. S.) had had bilateral otitis media in childhood, but the trouble had quickly and entirely healed.

3. *The Normal Responses from Stimulation of the Static Labyrinth.*—It has been assumed that stimulation of a normal labyrinth by a given requisite stimulus with the head in a given position will result in the production of (1) a constant type of

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after-nystagmus whose quick component will be in a certain direction and of a normal time period; (2) a particular type and degree of past-pointing; (3) an irresistible tendency to fall in a certain direction; (4) a sensation of dizziness; (5) nausea; and if the stimulation be continued, (6) vomiting. It is, therefore, essential before commencing observations on the patient's behaviour to stimulation of his vestibular system, to observe and note carefully his *spontaneous phenomena*.

4. *Integrity of the End-Organ of the Vestibular Portion of Eighth Nerve*.—In a case giving no history or evidence of middle-ear suppuration, it has been assumed that the end-organs of the vestibular portion of one eighth nerve are intact and functioning, if stimulation of the static labyrinth results in the production of one normal response.

5. *Table I.* is a rough summary of the whole series of brain tumour cases and is self-explanatory (page 138).

6. *Remarks on the Cases not given in Detail*.—Five cases are not given in detail. The first, J. G., requires no special comment. The second, L. F., is practically a parallel case to E. G., but is not so interesting in as much as the lesion had remained for years undiagnosed, and the case was hopeless from the time of admission. The third, M. G. P., as indicated, has been reported in detail in another publication. The fourth, E. G. P., was interesting because it was our first case of frontal tumour, and in our anxiety to discover localising signs we paid undue attention to a trivial error in past-pointing, despite the fact that all the other vestibular and acoustic responses were perfectly normal. Hence we made an erroneous localisation. But the case was an exceedingly difficult one and died without operation, and with a post-mortem finding unsuspected by any of the many consultants. The fifth, G. S., came to operation which failed to locate the lesion, and on recovery from her surgical wounds refused any further investigation despite the urgency of her symptoms and signs.

7. *Rinné Test*.—In every case where this test is cited it was performed by myself, with the same tuning-fork—128 d.v. With this fork in my hands in a sound-proof room, the fraction for a person of normal hearing is  $\frac{\text{A.C.}}{\text{B.C.}} = \frac{80'' \text{ to } 90''}{25'' \text{ to } 30''}$ , and when tested in an open ward is  $\frac{\text{A.C.}}{\text{B.C.}} = \frac{70''}{25''}$ .

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## (A.)—SUB-TENTORIAL TUMOURS—INTRA-CEREBELLAR

### 1. Case of Cholesteatomatous Cyst of Mid-line of Cerebellum.

E. G., female, white, single, age 25 (M.G.H., E.S. 242871), was admitted on 3rd May 1921 with the diagnosis of "brain tumour," complaining of frontal headache of three months' duration and occasional attacks of vomiting. Her present illness began three months ago with an attack of headache, malaise, cold in the head, and pains in the limbs. She was very sleepy during the attack and had a very stiff neck for a day and a half. Her physician said it was merely a severe cold. The "cold" lasted four weeks and, after it disappeared, her eyes commenced to ache and have continued to bother her ever since. She "saw double" to-day for the first time. She has had frontal headaches continuously for the past three months; they have varied in severity. She has had occasional vomiting attacks on awakening in the morning. The vomiting is accompanied by nausea but is not projectile. During the past two months she has been very constipated; her bowels have moved only with the aid of purgatives. For the last three weeks her appetite has been poor. She has been very dizzy from time to time, and during these attacks would definitely stagger and imagine that objects about her seemed to rotate to the right. She has never had any ear trouble, but has noticed ringing noises in her ears for the past three months.

#### OPHTHALMIC EXAMINATION.

On 5th May 1921 examination showed bilateral choked discs, three diopters in the right eye, and five diopters in the left.

#### OTOLOGICAL EXAMINATION.

(A.) *Spontaneous Phenomena*.—(1) Gait: she walks without much trouble and does not seem to deviate to either side. (2) Romberg: she sways backward tending to fall—the direction of falling not being affected by altering the position of the head. (3) Arm co-ordination: finger-to-finger and finger-to-nose tests are well done, but there is marked inco-ordination of movements of forearms, wrists, and fingers demonstrable by rapid movement. (4) Both arms past-point to the right from 3 to 5 inches. (5) Nystagmus: there is none on looking directly forwards, but markedly present on deviation of eyes upwards, downwards, to right and to left. (6) Eye movements: the left eye—on looking to right or left, can be rotated only half way out—there then occurs slow broad horizontal nystagmus poorly sustained and the eye returns to mid position. Right eye can be rotated to extreme right or left with much difficulty, and with the

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appearance of a nystagmus as described. Pupils react to light and distance. (7) Tympanic membranes normal, and hearing of ears equal and normal. Rinné test :—

$$\begin{array}{lcl} \text{Right ear,} & \frac{\text{A.C.}}{\text{B.C.}} = \frac{60''}{24''} & \text{Left ear,} \quad \frac{\text{A.C.}}{\text{B.C.}} = \frac{60''}{30''} \end{array}$$

(B.) *Induced Phenomena*.—Caloric test: water at 66° F. Right ear, with head 30° forward—(1) No nystagmus in mid position—no increase in spontaneous nystagmus on looking to right after douching for eight minutes thirty seconds; (2) no nausea and no vertigo; (3) both arms past-pointed 8 inches to right; with head 60° back, (4) no nystagmus in mid position. Left ear, with head 30° forward—(1) No nystagmus in mid position after douching for nine minutes; (2) no vertigo; (3) both arms past-pointed to the right as they did spontaneously; with head 60° back, (4) faint suggestion of horizontal nystagmus to the right in mid position; (5) very slight vertigo; (6) right arm past-pointed 1 to 2 inches to the left while left arm touched.

(C.) *Impression*.—Normal cochleæ; destructive lesion in brain-stem. It involves the pons, the right middle and inferior cerebellar peduncles, and the left middle cerebellar peduncle.

Neurological opinion on 7th May—Headaches: recurrent, lasting three to four hours, then relief. They suggest blocking of iter with pressure, then discharge and relief. Left eye winks less powerfully than right. Some left facial disturbance. Left abdominal reflex present, right weaker than left. Adiadokokinesia, especially on left side. Impression—Basal neoplasm chiefly on left side; advise cerebellar decompression. (Signed) W. E. PAUL.

*X-ray Report*.—Sella turcica is wide and shallow. Anterior clinoid process is flattened in appearance and the dorsum sellæ and posterior clinoid process appear very thin as though eroded or absorbed. The picture is somewhat suggestive of the appearance seen in the presence of a suprasellar tumour.

On 9th May ventricular puncture was carried out and an X-ray photograph taken. The injected left lateral ventricle filled partly with air—in all plates the left superior horn shows no evidence of air; sella turcica as described before. Findings suggest the presence of an intracranial tumour above the sella with obstruction of the communication into the left lateral ventricle.

On 12th May cerebellar exploration was undertaken by Dr W. J. Mixer. Both cerebellar hemispheres were markedly tense; ventricular puncture was carried out; recesses were carefully explored and no tumour found. On separating the lobes of the cerebellum a bluish cyst was seen showing at the lower edge of the vermis. The cyst

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occupied the mid-line and was as large as an English walnut. Vermis was incised and cyst opened and much cholesterin and hair evacuated. The cyst was entirely evacuated but only a portion of the cyst wall was excised. The cyst ran well up into the mid-brain. The patient was discharged to Tewkesbury Hospital on 27th June.

### 2. Case of Glioma of Cerebellum (fourth ventricle).

(See Plate I.)

M. L., female, white, single, age 13 (M.G.H., W.S. 245601), was admitted on 29th September 1921 to M.G.H. as a "probable brain tumour." She complained of failing vision and abnormal gait. Her family and previous history were negative. Four months ago her eyesight began to fail. Her family physician pronounced her "all right." One month later she was taken to an eye specialist who informed the parents that the trouble was in the optic nerves. Glasses were prescribed and eye drops administered for over two months without any effect on the failing vision. With the onset of this symptom, the patient also commenced to have dizzy spells and to walk abnormally. The dizzy spells occurred at intervals. The parents describe the gait as a "giving way at the knees." It became progressively worse. Patient has vomited four times without apparent cause since the onset of the illness, but she has not been troubled with headache or insomnia. Six weeks ago her parents took her to Worcester City Hospital for examination. She was subsequently admitted and kept four weeks and then transferred to this hospital with the diagnosis of "probable brain tumour." The examination showed a normally developed and nourished, intelligent young girl, confined to bed on account of almost complete blindness and inability to stand steadily. The significant physical findings are incorporated in the reports detailed below. Blood Wassermann test was negative on 20th September.

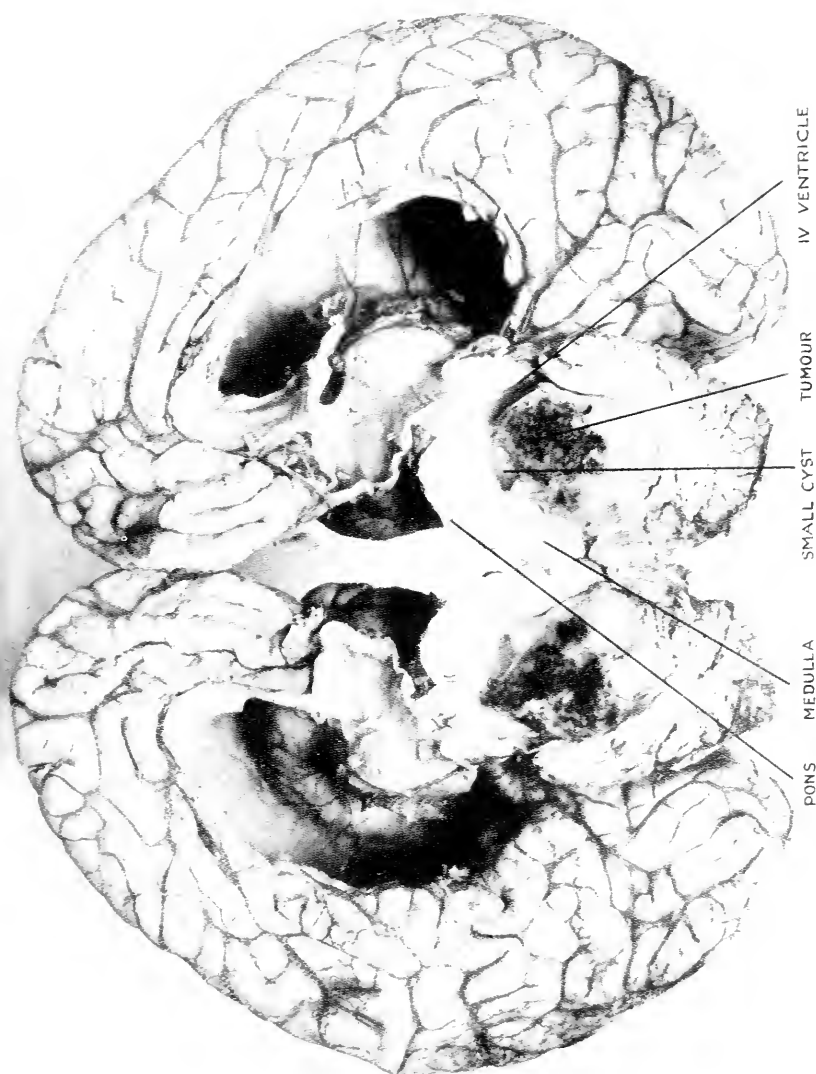
#### OPHTHALMIC CONSULTATION (1st October).

(1) Dilated pupils—no inequality—reacting very sluggishly; (2) movements of both eyes impaired equally in all directions; (3) no nystagmus; (4) both discs slightly blurred on temporal margins; (5) vision of both eyes much reduced—right eye, no vision—left eye, fingers seen at distance of one foot.

#### X-RAY OF SKULL (2nd October).

Absence of regular outline of sella turcica with marked irregularity of dorsum sellae indicating destruction in this region. Convoluted markings on inner table are unusually deep, suggesting intracranial pressure. Findings are strongly suggestive of an intracranial tumour.

NEURO-OTOLOGICAL EXAMINATION OF ELEVEN VERIFIED  
CASES OF BRAIN TUMOUR.—D. E. S. WISHART.



CASE II., M. I.—GLIOMA OF CEREBELLUM INVADING IVTH VENTRICLE.  
Antero-posterior medial section showing the two halves of the tumour occupying the cerebellum: the  
cavity of the IVth ventricle is seen at the periphery of the tumour.





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Pneumoventriculography on 5th October, when much fluid under considerable increase of pressure was obtained.

Plates of skull in various positions after injection of ventricles with air show the appearance of sella and inner table as previously described. All portions of the lateral ventricle were fairly well seen. They were unusually large. The third ventricle appeared to contain a small amount of air. In different positions, air passed freely from right to left lateral ventricle and they appeared symmetrical. In none of the plates was there evidence of a mass or of abnormal prominence visible in regions reached by the air. Findings indicated probable obstruction of the aqueduct of Sylvius, with marked internal hydrocephalus and much increased intracranial pressure. No tumour could be demonstrated.

### OTOLOGICAL CONSULTATION (11th October).

(A.) *Spontaneous Phenomena*.—(1) Ears: both tympanic membranes intact and slightly retracted—otherwise negative. No history of any ear trouble. Fistula test negative. (2) Hearing: left ear, no impairment of tone range or of air or bone conduction. Right ear, tone range is unimpaired but bone conduction is slightly longer and air conduction much less than in left ear. (3) Eyes: as described above (no nystagmus, nearly blind). (4) Romberg: unable to stand, falls backward; falls backward no matter in what position the head is placed. (5) Co-ordinate movements: fairly well done with both arms, but rapid movement demonstrates marked asynergy. Right arm much more ataxic than left. (6) Past-pointing: both arms uncertain, right arm past-points constantly.

(B.) *Induced Phenomena*.—(1) Rotation tests not performed. (2) Caloric tests: water at 62° F. Left ear, with head 30° forward—(1) After forty seconds a second-grade very wide and slow horizontal nystagmus, quick to left, appeared; this became absolutely definite; there was no rotary element whatever. (2) Past-pointing: right arm, 8 inches to left; left arm, 8 inches to right. With head 60° back—(3) The horizontal nystagmus to the left became replaced by a much quicker wide horizontal nystagmus to the right. (4) Both arms past-pointed 8 inches to the left. Right ear, with head 30° forward—(1) Poorly marked slow horizontal nystagmus quick to the left, appeared after one minute, and was only slightly more definite at the end of two minutes' douching; there was a questionable rotary element. (2) Past-pointing: left arm, 4 inches to right; right arm touched. With head 60° back—(3) Wide horizontal nystagmus quick to left. (4) Past-pointing: left arm, 4 inches to right; right arm touched.

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(C.) *Impression*.—(1) No lesion of either eighth nerve or end-organ. (2) The inverse and perverted nystagmus produced by stimulation of the left ear points to a lesion in the brain stem in the region of the nuclei of the third and fourth cranial nerves. (3) The questionably impaired hearing of the right ear; the failure to produce outward past-pointing with the right arm; the spontaneous inward past-pointing with the right arm; the ataxia of both arms, especially the right; the falling which is constantly backwards suggest cerebellar involvement and the right side more than elsewhere.

Neurological consultation on 15th October by Dr W. E. Paul—Knee jerks are both active, right perhaps more than left. Achilles jerks present; clonus on both sides, Babinski on right. Pupils are dilated and do not react to light or distance. All ocular movements seem incomplete. Suggestion at times of slight weakness of right facial nerve. When standing she leans backward and would fall backward. No history of subjective vertigo. Position sense of toes is preserved. No skin sensory loss or atrophy. Throat and tongue show no abnormality. Localisation is not possible by me. I suspect a process pressing on the crura cerebri.

Operation was performed on 20th October by Dr W. J. Mixer. Cerebellar exploration was undertaken. The cerebellum bulged strongly. This was relieved by ventricular puncture. No tumour was made out. There was probably a tumour of pons high up. Patient died on 21st October and an autopsy (4261) was made. The brain weighed 1500 grams (Plate I.). Convolutions of the convexities show some flattening. The brain to the touch in these regions fluctuates. On section the lateral and middle ventricles are markedly dilated and contain a large amount of rather clear reddish-tinged fluid. The third ventricle pouts in the region of its floor and presses on the pituitary gland which is slightly depressed and flattened. The gland otherwise is normal. The upper part of the fourth ventricle and the aqueduct of Sylvius show much dilatation. In the region of the fourth ventricle there is an ovoid mass of new growth, 4 cm.  $\times$  3 cm. in diameter, which apparently springs from the right half of the cerebellum in the region of its anterior half and middle portion. The tumour extends into and fills the lower two-thirds of the fourth ventricle and presses on the posterior portion of the medulla and pons. It is closely applied to the pons but is rather well marked off from the medulla. There is some compression flattening of the pons and medulla. The tumour tissue is spongy, soft to fairly firm, and shows a small cyst-like space in the region of the posterior portion of the pons. In other places there are small dark reddish areas. Microscopic examination reveals a glioma; the stroma is relatively large and vascular. The cells are sometimes polynucleated. Post-mortem diagnosis was that of (1) glioma of cerebellum and (2) internal hydrocephalus.

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## 3. Case of Cystic Glioma of Right Cerebellar Hemisphere.

R. A., female, white, single, age 19 (M.C.E. & E. Inf., H.C. 34596), admitted 5th January 1922 to wards from Out-Patient Department of M.C. Eye and Ear Infirmary, for "study." Her history prior to admission was that she entered the Peter Bent Brigham Hospital on 12th December 1921, complaining of constant severe headaches for the previous two months. She gave a history of frequent head colds, but for the past two months had had almost continuous headaches, severe in character, beginning over the right eye, progressing up over the vertex and to the right side of the neck. These had been accompanied especially in the last two weeks by nausea, vomiting, and vertigo.

Physical examination showed marked scarring on the right arm and leg, but nothing further was noticed. Ophthalmoscopic examination showed a very slight faintness of the margins of the optic discs, with physiological cupping and no signs of choked disc. Vessels were somewhat distended but with no evidence of sclerosis: no hæmorrhage or exudate was seen. Blood Wassermann test was negative. Light was well transmitted through both antra, with the exception of the superior third of the left maxillary sinus. The roentgenogram showed clouding of the right antrum with incomplete development of the right frontal sinus. On 28th December 1921 the patient was discharged from hospital with the note: "No possible cause for the headaches has been discovered other than the clouded antrum," and the diagnosis was that of chronic maxillary sinusitis. On 30th and 31st December 1922 examination at the Throat Department of the Massachusetts General Hospital confirmed the above transillumination and X-ray findings, but, as the douching solution returned perfectly clear from the right antrum, Dr D. C. Greene considered that the right antrum was not the cause of the headaches.

One of the clinicians then suggested that the patient should visit the Ear Clinic and ask for investigation into the cause of her vertigo. This was carried out on 5th January 1922. The family history was excellent, and the patient's previous history disclosed no significant feature. The headaches commenced three months ago. They begin over the right eye, radiate across the top of the head to the back of the neck, and vary in duration from five minutes to all day long. A hot flush comes over her with the headaches. She vomited every day at first. The vomiting came on without nausea but was not projectile. It has been less severe for the last two weeks. For three months she has been dizzy and has felt as though she were going to fall backward all the time. As a result it frequently takes her two hours to dress. The only relief she gets from the vertigo is when she

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is lying down. She has never had ear trouble and she has not noticed any deafness in either ear at any time. For the last six days only, she has noticed tinnitus in the *left* ear. It sounds like the ringing of a shell but has a beat to it. For at least a month she has had frequent attacks of hiccough. They last for about five minutes but do not occur every day. The patient was a neat, sensible, alert young girl apparently distressed by headache and dizziness. General physical examination was negative. Neurological examination—1st, 3rd, 4th, 5th, 6th, 7th, 11th, and 12th, cranial nerves normal; 10th nerve; she hiccoughs frequently; 2nd and 8th, recorded below. Cerebration, normal. Cerebellar function, see below under "Ears." Reflexes showed no abnormality. No motor or sensory abnormality discovered.

### OPHTHALMOLOGICAL EXAMINATION.

No spontaneous nystagmus: hemorrhages were observed along veins on temporal side of left optic disc.

### OTOLOGICAL EXAMINATION.

Tympanic membranes normal. She can hear all forks with each ear.

$$\text{Right ear, } \frac{\text{A.C.}}{\text{B.C.}} = \frac{65''}{15''}. \quad \text{Left ear, } \frac{\text{A.C.}}{\text{B.C.}} = \frac{40''}{12''}.$$

She complains of intermittent tinnitus in left ear.

(A.) *Spontaneous Phenomena.*—(1) Spontaneous horizontal nystagmus to right on deviation of eyes to the right: this is more marked with head upright than with head tilted 60° back. (2) She can stand on either foot. Romberg negative. Dizziness increased when head is tilted toward right shoulder. Gait unsteady. (3) Inward past-pointing with both arms. (4) Co-ordination of fingers, wrists, and forearms is good if tested slowly. Rapid movement demonstrates inco-ordination of movements of both forearms, the left more than the right.

(B.) *Induced Phenomena.*—Rotation Test: turning to the right produced a very wide horizontal after-nystagmus, quick to the left, lasting twenty-seven seconds. Turning to the left produced a very wide horizontal after-nystagmus, quick to the right. Caloric test: water at 66° F. Right ear, with head 30° forward—(1) No nystagmus after five minutes' douching; (2) no vertigo or nausea; (3) past-pointing—same as spontaneous; with head 60° back—(4) a questionable very slow conjugate deviation of eyes to right; (5) past-pointing—same as spontaneous, with head 30° forward. Left ear—(1) No nystagmus after five minutes' douching; (2) no vertigo or nausea; (3) past-pointing—same as spontaneous; with head 60° back—(4) wide horizontal nystagmus to right; (5) both arms showed past-pointing

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to left, the right arm more marked than with the spontaneous movement; the left arm arched to the left and then touched.

On 6th January 1921, intermittent fronto-occipital headache continues. Spontaneous nystagmus and past-pointing same as yesterday. An ophthalmic consultation by Dr G. S. Derby showed—Right eye, commencing swelling of the nerve-head; nerve-head hyperæmic; veins slightly tortuous and smaller arteries are also tortuous. Left eye, showed swelling of three diopters; vessels very tortuous and a few hemorrhages around disc.

On 7th January, patient is having about five severe headaches daily. They are more severe in the morning and evening than they are during the middle of day. In walking, patient tends to stagger to the right. There is no vomiting. Thorough re-examination with findings unchanged from those of 5th January. A special examination of horizontal canals of both ears was made on 8th January. Caloric test: water at 62° F. Patient was tested lying on back, with head tilted 60° back from upright position. Right ear—(1) After fifty-five seconds a very slow horizontal nystagmoid movement, quick to left, appeared. It gradually died away and had practically disappeared after douching had been continued for five minutes. (2) She past-pointed 4 inches to right with each arm. (3) Patient not inconvenienced in the least. No suggestion of nausea. Left ear—(1) After twenty seconds there appeared a marked horizontal after-nystagmus, quick to the right. (2) Past-pointing: none. (3) Patient not inconvenienced; no nausea.

Ophthalmic examination showed slight increase in signs in fundi of both eyes.

A note on 10th January recorded that in the past twenty-four hours the patient has had six severe attacks of headache with one attack of projectile vomiting. There was a short period of diplopia on looking to right. On 12th January the following report was handed to the Chief of the Aural Service with the suggested diagnosis of right intracerebellar tumour, and it was transmitted to Peter Bent Brigham Hospital with the request for re-admission of the patient:—

(C.) *Summary of Patient's Condition.*—*Subjective Phenomena:* (1) Intermittent very severe fronto-occipital headaches on right side, two and a half months' duration, lasting from two minutes to two hours. (2) Dizziness in short attacks, five weeks' duration. (3) Unsteadiness of gait, walks to right. (4) Vomiting attacks, without apparent cause, now absent. (5) Tinnitus, left ear. (6) Blurring of vision on looking to right. (7) Diplopia on looking to right and sometimes ahead, up, and down, 10th, 11th, and 12th January. *Objective Phenomena*—(a) Negative findings: (1) X-rays of sinuses clear; right frontal sinus is small; septum deviates to right; right

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antrum has been washed and is clean, nothing being found. (2) No lesion found of any cranial nerves, except as noted below. (3) Cerebration, orientation, and memory undisturbed. (4) Middle ears and acoustic portions of both eighth nerves show no abnormality. (b) Positive findings: (1) Staggers to right. (2) Slight inco-ordination and asynergy of arm movements on rapid movement. Spontaneous inward past-pointing both arms. (3) Spontaneous horizontal nystagmus on right deviation of eyes. (4) Both static labyrinths are active, but there is no response whatever from stimulation of vertical canals on either side, and abnormal and diminished response from horizontal canals on right side—good response from horizontal canals of left ear. (5) During stay here there has been progressive increase in signs in fundi of both eyes; the left eye shows choked disc with swelling of three or four diopters, very tortuous vessels, and a few hemorrhages around disc; the right eye shows choked disc of about two diopters with slightly hyperæmic nerve-head and slightly tortuous veins and smaller arteries. *Impression*: organic intra-cranial subtentorial lesion.

(Signed) EUGENE A. CROCKETT,  
*Chief of Aural Staff.*

### EYE CONSULTATION (13th January).

Vision—right eye  $\frac{20''}{70''}$ ; left eye  $\frac{20''}{200''}$ ; vision fields, negative.

Eye muscles—With the test rod no diplopia in the horizontal plane; the diplopia is marked in the vertical plane above and below the horizontal. *Impression*—(1) sixth nerve probably intact; (2) more than one branch of third nerve involved.

On 15th January patient has had no fever, and no pulse or respiration disturbance. The diplopia and also the headaches are increasing in severity. Patient has been more or less prostrated for the past two days. On 16th January patient was transferred to P.B.B. Hospital. On 21st January at the P.B.B. Hospital, Dr Harvey Cushing performed a cerebellar decompression. There was greatly increased intra-cranial pressure, and herniation of the right side of the cerebellum through foramen magnum to the level of the axis. A very deeply placed large cystic glioma of right cerebellar hemisphere was tapped and evacuated. A good recovery followed.

### COMMENTARY ON INTRA-CEREBELLAR TUMOURS.

1. Each of these cases had normal hearing; there was no evidence of a lesion of the cochlea or of the intra-cranial course of the eighth nerve.

2. Each showed at least one abnormal or absent response to stimulation of a static labyrinth.

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3. Three of them gave an ocular response to stimulation of the horizontal canals of both ears, but showed no response whatever to stimulation of the vertical canals of both ears. The assumption was made that the end-organ and vestibular nerves were intact and functioning, but that the vestibulo-ocular reflex-arc from the vertical canals of both ears was blocked.

4. One case, L. F., gave no response whatever to stimulation of either static labyrinth. As there was no impairment of the acoustic nerves and no history or evidence of middle-ear suppuration, it was assumed that all the known reflex arcs of both vestibular nerves were blocked medial to the superficial origin of the nerves.

5. It is most instructive to consider carefully certain points about the cases M. L., E. G., and L. F.:—

(a) In the case of M. L., the abnormalities consisted in an almost similarly impaired nystagmus following stimulation of each vertical canal and an abnormal past-pointing of the left arm following stimulation of the left vertical canal. Against this had to be weighed the evidence that stimulation of each set of canals did produce both an ocular and a cerebellar response.

These points should be carefully considered in conjunction with the post-mortem description and photograph of the actual lesion. It is interesting to see how very large a sub-tentorial tumour may be and yet how comparatively slight the abnormality of the vestibular responses. Note, however, that the lesion was essentially a tumour of the fourth ventricle and not of the cerebellum.

(b) Contrast the above with the case of E. G., in whom a smaller tumour caused blockage of all the vestibular reflex-arcs, except those from the left horizontal canals and the past-pointing pathways from the right vertical canals.

(c) Contrast both the above with the case of L. F. (see especially Table II.). At operation on L. F., "exposure revealed no tumour until the vermis had been sectioned, when an infiltrating new growth of the upper medulla and pons was exposed. Growth completely closed off the aqueduct of Sylvius." It is most interesting to note that this extensive growth completely blocked all the static labyrinth reflex-arcs, and yet allowed both acoustic nerves to function acutely.

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## (B.) SUB-TENTORIAL TUMOURS—EXTRA-CEREBELLAR

### 1. **Neuro-Fibroma of Right Cerebello-Pontile Angle.**

The patient, F. A., female, white, married, age 23 (M.G.H., W.S. 246639), was admitted 20th November 1921 to M.G.H. from Emergency Ward, complaining of (1) sore throat; (2) difficulty in breathing; (3) unable to see with right eye; (4) deafness in right ear; (5) pain in the back of neck; (6) general weakness. Her previous health had been good. She considered herself in unusually good health up to one year ago. For about one year she has known she was deaf in the right ear, and that the vision of her right eye was failing. The present illness commenced twenty days ago; while in the seventh month of pregnancy she was seized with severe pain in the lower abdomen, became dizzy in a few moments, fell, and was unconscious for a few moments. She remained in bed for the rest of the day, complaining of headache. The next day she was admitted to hospital and was delivered, the baby being born in good condition. She remained in hospital for two weeks, during which time she complained constantly of a dry choking sensation of the throat, could not swallow solid food, and was kept awake at night by severe right frontal headaches. Five days ago she returned home, where she remained confined to bed. She has had only small amounts of food, chiefly milk, which has been fed to her by spoon. There has been no abdominal pain, no vomiting, and no nausea. She has never had any ear trouble, and only became aware of her deafness in the right ear by accident. The deafness, she now recollects, was preceded by noises in the right ear.

Examination showed a well-developed and fairly well-nourished female, prostrated, and in a semi-stuporous condition, with deep groaning, guttural respiration. Tongue heavily coated and protrudes to left with slight coarse tremor. Soft palate hangs limp, and pharynx and mouth are coated with sticky exudate. General physical examination and examination of blood and urine show nothing of significance. T. 101°; P. 96; R. 20; blood pressure 106/66; alveolar CO<sub>2</sub>—35 mm. Hg.; non-protein nitrogen—28.8; blood Wassermann and spinal fluid Wassermann negative. Lumbar puncture gave cerebro-spinal fluid under pressure, greater than 350 mm. Hg., otherwise negative.

Neurological consultation on 1st December was as follows:—History very suggestive of sub-tentorial tumour. The important subjective points are: Tinnitus followed by deafness of right ear, progressive difficulty in swallowing, and loss of eyesight. Patient now shows paresis of right seventh, eighth, and ninth cranial nerves and double choked disc. Arm and leg reflexes difficult to obtain. No clonus; no Babinski; no sensory or motor loss. Advise sub-occipital exploration as soon as possible. (Signed) VIETS.



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## OPHTHALMIC CONSULTATION.

Very marked swelling of each disc—more than four diopters. Great tortuosity of vessels. White exudate on margins of discs, and occasional hemorrhages. Decompression advised from eye standpoint. (Signed) G. S. DERBY.

## X-RAY REPORT.

No evidence of intra-cranial changes in the base of the skull.

## OTOLOGICAL EXAMINATION (2nd December).

Patient prostrated in bed as described above, but she was carefully raised to sitting position when indicated below.

(A.) *Spontaneous Phenomena*.—(1) Spontaneous nystagmus of slight grade on looking upwards or to extreme right or to extreme left. None when looking ahead or down. (2) Paresis of right external rectus. (3) Paresis of right side of face. (4) Marked weakness of masseter and tensor palati muscles on right side. (*Note*.—The contrast in the movement of the two Eustachian cushions was so easily demonstrable by the electric nasopharyngoscope that it was shown to the attending physicians and a number of students to their complete satisfaction.) (5) Co-ordination tests very poorly performed, especially by right arm. (6) Ears: tympanic membranes intact and normal; normal hearing in left ear; total loss of hearing by air conduction in right ear.

(B.) *Induced Phenomena*.—(1) Caloric test: water at 62° F. Right ear, with head 60° back—(1) No nystagmus when looking ahead after five minutes; with head 30° forward—(2) No nystagmus. (3) No vertigo, no nausea, no vomiting. Left ear, with head 60° back—(1) Definite second grade horizontal after-nystagmus, quick to right, appeared after thirty-five seconds; with head 30° forward—(2) Confused eye movements for a few moments, then slight but quite definite horizontal nystagmus, quick to left.

(C.) *Summary*.—(1) Total loss of function of cochlear and vestibular divisions of right eighth nerve. (2) Both parts of left eighth nerve functioning. (3) Stimulation of left horizontal canals produced a normal ocular response, but stimulation of left vertical canals produced a *reversed and inversed* ocular response.

(D.) *Impression*.—Destructive lesion of right eighth nerve; possibly a tumour of right cerebello-pontile angle. The reversed and inversed after-nystagmus seems to indicate involvement of the brain-stem not merely by pressure but also by infiltration. Operation of cerebellar decompression and exploration was performed by Dr W. J. Mixer on 3rd December 1921, when a tumour the size of an egg was

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found in the right cerebello-pontile angle. It passed far forward close beside the pons and was excised with considerable difficulty. Considerable shock, and patient transfused on the table. Patient died the evening of the operation, but post-mortem examination was refused.

Pathological Report—A large solid tumour measuring  $4.6 \times 4 \times 3.5$  cm., and weighing 32 grams. Surface everywhere smooth. Its consistency is firm and resilient. There are a few places somewhat softer and yellowish in colour. On section: the cut surface is smooth, glistening, slightly mucoid, and shows small yellowish, slightly softened areas. Microscopic examination shows a richly cellular tumour composed of spindle-cells arranged in interlacing bundles. Its cells in places differentiate to fibroblasts and their fibrils are separated by fluid. In general the cells are more atypical and vary considerably in size and shape. No mitotic figures can be found, although there are occasional multi-nucleated cells. The growth arises from the nerve sheaths and it is probably not sarcomatous. Neuro-fibroma.

(Signed) H. F. HARTWELL.

### 2. Case of Cholesteatomatous Cyst of right Cerebello-Pontile Angle.

M. M. N., female, white, single, age 24 (M.G.H., E.S. 242762), was admitted on 21st April 1921 to the East Medical Service for "study." A slender, well-proportioned, delicate, unmarried girl who walked into hospital, was referred by her physician for daily headache of one year's duration, which was on the increase. She is now weak and much run down. Her previous health always good, except for habitual constipation and an amenorrhoea of seven years' duration. There were no previous illnesses. Her present illness began in a vague uncertain manner, about a year ago, and without any apparent cause. The symptoms noted below have had the appended approximate duration. Each symptom and the whole group have never been very severe. At times they have been slightly more severe than at others, and each has seemed to increase gradually in intensity. During one year she had suffered from:—(1) Severe headache, mostly at the occiput, radiating to frontal area, often located over the right eye; (2) numbness right side of face; (3) deafness of right ear, but never recognised to be total. For six months from:—(1) Tinnitus, right ear (intermittent), and usually only when she closes her eyes (not severe), referred definitely to right ear; (2) vertigo, spells of dizziness without falling but with suggestion of subjectively falling to the right; (3) staggering to the right. For two weeks from:—(1) Blurring of vision of right eye; (2) binocular diplopia; (3) sudden attacks of vomiting, preceded by nausea; (4) increasing

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huskiness of voice. General physical examination and blood Wassermann were negative on 28th April.

Neurological consultation by Dr J. B. Ayer, on 10th April, when findings were:—Right third nerve paresis; right fifth nerve partial anaesthesia; right seventh nerve slight palsy; right eighth nerve deafness, moderate. Taste disturbance on anterior portion of right side of tongue. Either ataxia or asynergy of arms is strongly suggested, especially on the right. Double Babinski; suggestive clonus on left side only, with very lively knee-jerks. Fundi appear normal. Diagnosis of acoustic nerve tumour is first choice, the absence of choked disc being the chief point against it. We must consider chronic inflammatory disease, such as syphilis, but should not as yet perform lumbar puncture to exclude it. Recommend X-ray plate to show internal auditory meatus; also Bárány tests. Expert eye opinion indicated some abnormality if tumour is of any size.

## X-RAY OF SKULL (1st May).

Nothing definitely pathological found in skull.

## OPHTHALMIC CONSULTATION (2nd May).

Vision—O.D. = 20/30; O.S. = 20/15. Fields normal. Fundi normal.

## OTOLOGICAL CONSULTATION.

(A.) *Spontaneous Phenomena*.—(1) Tympanic membranes normal. (2) Hearing: left ear normal; right ear hears nothing by air conduction. (3) Nystagmus: slow nystagmus, horizontal to left while looking ahead or up or down, increased on deviation of eyes to left; horizontal nystagmus, quick to right on looking to right. (4) Slight vertigo. (5) Past-points 5 inches inward with right arm; left arm touches or past-points to the left. (6) Arm co-ordination tests fairly done, show slight ataxia of both arms but more with right arm.

(B.) *Induced Phenomena*.—Caloric test: water at 68° F. Left ear with head 30° forward—(1) Spontaneous nystagmus to the left stopped after thirty seconds' douching, and fifteen seconds later was replaced by a definite rotary nystagmus, quick to right; (2) slight vertigo; (3) both arms past-pointed to the left normally; with head 60° back—(4) good horizontal nystagmus, quick to right; (5) vertigo more marked; (6) both arms past-pointed to left normally. Right ear with head 30° forward—(1) No increase in the spontaneous nystagmus although douching was kept up for ten minutes and twenty seconds; (2) no vertigo, no nausea, no vomiting; (3) both arms past-pointed to the left; with head 60° back—(4) no increase in spontaneous nystagmus; (5) no vertigo; (6) both arms past-pointed to left.

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(C.) *Impression*.—A destructive lesion of both divisions of right eighth nerve in right cerebello-pontile angle.

Neurological consultation by Dr J. B. Ayer, on 3rd May, when patient was tested for cerebellar function. Strong suggestion of asynergy and adiadokokinesia found in right hand and arm, deep muscle sense very fair in this hand; no spontaneous past-pointing with either hand. Patient walks regularly to the left but does not stagger; tests for pelvic girdle and shoulder girdle stability show no abnormality; knee jerks equal and lively; no clonus or Babinski to-day; case strongly suggests tumour of right acoustic nerve. On 3rd May she felt better; no headache; eats fairly well, no constipation; throat consultation; no paralysis in throat or larynx. On 7th May nausea, vomiting, and headache for past two days; eats very little but takes fluids well; is fairly comfortable when lying flat and quiet. On 15th May for most of past week has had slight pyelitis, but temperature has been normal for two days; urine is fairly clear, and there is less tenderness in kidney region.

### OPHTHALMIC EXAMINATION.

Left fundus apparently normal; right seems to show blurring of edge of disc with a question of very slight swelling; the vessels do not seem to dip in. On 16th May, nausea and vomiting. On 18th May no nausea or vomiting, but slight headache. On 18th May lumbar puncture was carried out and 10 c.c. clear fluid were removed. Pressure 300, 230, 120. Oscillation normal—on coughing gives an oscillation of 10 to 20 mm. Cells 60, of which 53 were lymphocytes. Wassermann negative. (There was no trouble during or after the removal of the spinal fluid.)

Neurological consultation by Dr J. B. Ayer, on 21st May, showed that symptoms and signs remain essentially the same, although the former are somewhat intermittent in character. Evidently lumbar puncture relieved temporarily an increased intra-cranial pressure, which seems assured from the pressure reading of over 300 mm., despite the absence of papillitis. The pleocytosis is not inconsistent with brain tumour although more frequently seen in brain abscess, or chronic inflammation of meninges. With such persistent localising signs, investigation of right posterior cranial fossa is indicated with expectation of finding an acoustic nerve tumour. On 25th May she was feeling much better, appetite good, no nausea, vomiting, or headache. On 27th May operation was performed by Dr W. J. Mixer, when the posterior third of the foramen magnum, and the atlas were cut away. A cyst was seen in front of the seventh and eighth nerves on the right side. It was opened and evacuated and found to extend to the median line in front of pons. The wound was closed in layers.

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Subsequent pathological reports were made by H. F. Hartwell, and are as follows:—(1) Fluid from cyst: heavy brown fluid; on surface shiny particles; microscopically shows many cholesterol crystals, some fatty droplets and much amorphous material; culture, no growth; Wassermann negative. (2) Brain: microscopic examination of a small fragment shows the walls of a cyst thrown into folds and composed of connective tissue; it is lined by epidermis. Cholesteatoma. On 17th June uneventful recovery was made; the symptoms had disappeared and the patient was very well. On 19th June she was discharged.

### 3. Case of Plexiform Angioma of Left Side of Pons.

P. W. M., male, white, single, age 16 (M.G.H., W.S. 246510), was admitted on 23rd November 1921 from the Neurological Out-Patient Department, with diagnosis of probable "cranial neoplasm." He complained of (1) sub-occipital headaches; (2) staggering gait; (3) dizziness; (4) nausea and vomiting; (5) poor vision. His family history was poor, father and mother had tuberculosis, and there were no other children. Previous health was good. The present illness commenced six months ago with transient throbbing bilateral occipital headache, which would come on after bending forward or after running; he also remembers slight staggering when he walked, but to this he paid no attention. At first the headaches would last only two or three minutes, but they have gradually increased in frequency and duration. Since the onset he has had much indigestion late at night. Next morning he would have a headache accompanied by nausea, and he would induce vomiting by putting his finger down his throat. He vomited spontaneously once only and the vomiting was not of the projectile type. The nausea and vomiting have been more severe during the past month. The vomiting sometimes relieves his sub-occipital pain. Two months ago the sight in his left eye began to fail. He did not know that the vision in his right eye was poor until a few days ago. For three months his friends have noticed that he staggered as he walked. He has had some pain in right arm and shoulder and some dizziness for one month. Three weeks ago he began to be deaf in the left ear without any pain or evidence of middle-ear disease. He noticed no tinnitus and had during that time what seems to have been two olfactory hallucinations, when he thought he smelt ether and asked his father if there was any about the place. Examination showed a well-developed and fairly well-nourished school-boy. General physical examination negative. Mentality somewhat "cheeky."

Neurological examination made by house surgeon showed:—(a) Cranial nerves: (1) Two olfactory hallucinations (see above);

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smells normally. (2) Vision: left eye poor; both eyes show hæmorrhagic neuro-retinitis; both discs show marked optic neuritis, the left more than the right; eighth (see later); other cranial nerves negative. (b) Memory and disposition were unchanged; impression is that "he is a very fresh kid" and takes his troubles with undue levity; states he has always been this way; notices no loss of memory. (c) No sensory or motor loss; sphincters intact. (d) Reflexes: cremasteric reflexes absent: otherwise negative; urine, differential and leucocyte count, hæmoglobin and blood pressure, normal.

### OTOLOGICAL EXAMINATION (25th November).

(A.) *Spontaneous Phenomena*.—Ears: (1) Tympanic membranes intact, normal; no history of ear trouble except as noted under present illness. (2) Hearing: right ear, whisper at 10 feet, hears all tones; Rinné:  $\frac{A.C.}{B.C.} = \frac{40''}{15''}$ . Left ear, cannot hear conversational

voice; hears tones below but not above 512 d.v.; Rinné:  $\frac{A.C.}{B.C.} = \frac{16''}{12''}$ .

(2) No nystagmus; no tremor. (3) Past-points 6 inches to left with both arms. (4) Romberg: he sways but does not fall. (5) Gait: he staggers and has much trouble in keeping to a straight line, but does not tend to fall in any one direction. (6) Co-ordination: finger to nose test done poorly, especially with right arm; impression, that he shams inco-ordination when finger, wrist, and forearm tests are tried; boy tends to be very impatient.

(B.) *Induced Phenomena*.—Caloric test: water at 65° F. Right ear, with head 30° forward—(1) Good first grade rotary after-nystagmus, quick to the left appeared after forty-five seconds. (2) Very dizzy but no nausea or vomiting. (3) Past-pointed 6 inches to right with both arms. With head 60° back—(4) Good horizontal nystagmus, quick to left. (5) Very dizzy. Left ear, with head 30° forward—(1) After fifty-five seconds' douching there appeared a few irregular twitches, rotary, quick to the right; the douching was continued for three minutes without much increase in intensity of the twitches; the latter remained irregular and quick to the right but were a mixture of horizontal and rotary movements. (2) No complaint of dizziness. (3) Both arms past-pointed very slightly to the left, not more than spontaneously. With head 60° back—(4) Irregular broad horizontal nystagmus quick to the right. (5) Very slight dizziness; no nausea, no vomiting. (6) Both arms past-pointed definitely to the left, but not more than spontaneously.

(C.) *Summary*.—(1) Loss of greater part of tone scale, and marked impairment of hearing in left ear. (2) Spontaneous past-pointing to the left. (3) Normal response from static labyrinth of right ear. (4) Diminished, impaired, and slightly perverted response from static

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labyrinth of left ear; from the vertical canals there was probably no past-pointing; the ocular response was delayed, impaired, and perverted, and there was no dizziness, nausea, or vomiting.

(D.) *Impression*.—Organic intra-cranial lesion interfering with all sets of fibres of left eighth nerve—possibly left side of pons.

### X-RAY EXAMINATION (26th November).

Suture between frontal and parietal bones is unusually wide. There is also considerable mottling of the shadows of the frontal bone, such as is seen with localised intra-cranial pressure. Outline of sella turcica is somewhat irregular, size is not increased, the space between the clinoid processes is narrow. Possible tumour of frontal region. On 27th November, patient has been fairly comfortable since admission. Occasional headaches or a spell of nausea after eating. Clinically and by X-ray, increased intra-cranial pressure is certain. Lumbar puncture has not been done because of probable risk from suspected tumour.

Neurological consultation and opinion on 29th November by Dr Viets showed:—Positive symptoms: (1) sub-occipital headache, six months; (2) nausea and vomiting, two months; (3) loss of vision, three months, more on left; (4) loss of hearing, three months, more on left; (5) staggering gait, two months, slight. Objective signs: (1) bilateral choked discs, more on left; (2) deafness, left; (3) loss of vestibular function, left; (4) Romberg, slight. *Impression*—Left intra-cerebellar tumour. Advise exploration.

A surgical consultation was held on 29th November when Dr Mixer advised exploration. Operation was performed by Dr W. J. Mixer on 2nd December; usual crossbow cerebellar decompression: ventricle tapped; tumour presented in lower part of left side of pons. Patient died on 4th December. The subsequent pathological report recorded a soft spherical or oval tumour with a smooth, deep red capsule measuring 3.5 cm. in diameter. Microscopic examination shows a plexiform mass of larger and smaller thin-walled blood-vessels in a loose areolar stroma; no evidence of malignancy. Plexiform Angioma.

### COMMENTARY ON EXTRA-CEREBELLAR TUMOURS.

1. Each of the three cases had unilateral abnormal hearing; there was evidence of a more or less complete blockage of acoustic impressions on the same side as the blockage of static labyrinth responses.

2. The two cases of large tumour of the cerebello-pontile angle had unilateral abnormality of the responses from the

static labyrinth; there was evidence of complete blockage of all the reflex-arcs of the vestibular nerve on the same side as the reduced hearing. The deduction to be made in each case was that the lesion was peripheral to the superficial origin of the eighth nerve; the lesion was, therefore, in the nerve trunk or in the end-organ. The decision in favour of the former and against the latter location was made after consideration of the other neurological data.

3. The third case, P. W. M., had unilateral abnormality of the responses from the static labyrinths on the same side as the reduced hearing. The blockage of the reflex-arcs of the affected vestibular nerve was not complete; the vestibulo-ocular reflex-arcs responded nearly normally, the abnormality existing in the vertical and not in the horizontal canal pathway. There was complete blockage of the vestibulo-cerebellar reflex-arcs of both types of canal of the left ear.

4. In the case of F. A., it will be noted that the otological diagnosis was correct, but that the further suggestion that the brain-stem was involved not merely by pressure but "also by infiltration," was *probably* incorrect. It can, of course, be objected that there was no autopsy, and, therefore, might possibly have been correct. The writer, however, considers that the supposition was incorrect. The supposition was based upon the observation that stimulation of the vertical canals of the left ear did not produce a rotary after-nystagmus quick to the right, but that it produced "confused eye movements for a few moments followed by slight but quite definite horizontal nystagmus quick to the left."

The writer's explanation is as follows: The patient was raised to a sitting posture, and her head was brought from the 60° back-position to the 30° forward-position, and as long as her head was exactly in that position there was no confused nystagmus; when her head was bent a little more forward, the movements became more marked but were still confused, and when bent a little more forward, the horizontal nystagmus quick to the left appeared. The latter is a perfectly normal reaction to cold syringing of the left ear. In other words, the fact that the head was placed in an incorrect position, was not observed, the normal response in that position appeared, and was, therefore, reported as "reversed and inversed," and a logical but erroneous deduction made.



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5. In the case of F. A., the definite paresis of the motor part of the right fifth nerve had not been made until the nasopharyngoscope demonstrated the great relative inactivity of the right tensor tympani muscle.

### (C.)—SUPRA-TENTORIAL TUMOURS.

#### 1. Case of Glioma of Left Frontal Lobe.

I. S., female, white, married, age 31 (M.G.H., W.S. 245288), was admitted on 13th September 1921 with diagnosis of "brain tumour." She complained of paroxysmal attacks of frontal headache and impairment of vision of six weeks' duration. Her previous history disclosed many attacks of sore throat up to five years ago; two attacks of acute articular rheumatism. She married six years ago, but lived with her husband for two days only. Her present illness commenced about six weeks ago: patient felt weak and could not walk; apparently unable to maintain her balance. There were severe supra-orbital headaches for a month—often twice a week—for which she received some relief from medicine given by her physician. Her vision has been failing for six weeks—more rapidly during past two weeks. (Note by clinical clerk—"Memory vague; patient did not co-operate well.") The physical examination was essentially negative, blood pressure being 110/80.

Neurological examination—Pupils react to light and distance; very slight lateral nystagmus, more to left; speech is slow and difficult but not inarticulate; sways on feet, tends to fall to right; mental processes retarded; memory impaired.

On 15th September medical diagnosis was made of sub-tentorial lesion; Wassermann negative. On 16th September an otological report was made by one of the residents: Ears and labyrinths normal; tests suggest cerebellar tumour; certain points suggest right side; it might be well to repeat examination. On 18th September patient was sent to the Eye and Ear Infirmary for a complete otological examination and opinion by myself. She first went to the Eye Department and the report made there was then sent up to the Bárány room to me, and incorporated by me in the following written report sent to the Surgical Ward with the patient.

#### OTOLOGICAL EXAMINATION.

(A.) *Spontaneous Data and Phenomena.*—The patient was confined to bed, but she can walk normally if she wants to; is in good general physical condition. She complained of paroxysmal attacks of frontal headache and impairment of vision of six weeks' duration. There was total absence in the history of—sub-occipital headache, deafness,

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tinnitus, dizziness, sense of rotation of objects or of person, falling, vomiting, diplopia, aural pain, nasal trouble, and photophobia. The drumheads are intact, dull, somewhat opaque, and retracted; they show calcareous deposits and light reflex is absent; history of bilateral ear trouble as a child but none since. Perfectly normal hearing (see also under cerebation). Eyes: movements normal; very slight nystagmoid jerks on lateral deviation of eyes; vision: O.D. = 20/30: O.S. = 20/40; papillœdema of right optic disc; choked disc of about two diopters; some atrophy of left optic disc; hemorrhage of left inferior temporal vein. Romberg test gave slight swaying. Co-ordination tests: all tests poorly performed, especially by right hand; all purposed movements very badly performed; any movement tried was done correctly at least once; past-pointing very uncertain (see cerebation). Cerebation: low standard of intelligence; slow mentally; volition and concentration abnormal; patient hears acutely and responds quickly if a statement derogatory to her is made; is quick to take offence and is then quite surly; quickly forgets the fancied slight, and takes up a new one on slight provocation; at other times apparently does not hear; once during examination fancied that she heard someone in the room say "the girl is contagious"; at another time she suddenly remarked, "My . . . father . . . died . . . my father died many years ago," and then said nothing more.

(B.) *Induced Phenomena*.—Caloric test: water at 66° F. Right ear with head 30° forward—(1) Rotary after-nystagmus, quick to the left, appeared after forty seconds: with head 60° back—(2) Good horizontal after-nystagmus, quick to the left. Left ear with head 30° forward—(1) Horizontal after-nystagmus, quick to the right with no rotary element, appeared after fifty seconds. With head 60° back—(2) Good horizontal after-nystagmus, quick to the right. (*Note*—Owing to the mental condition of the patient it was useless to try past-pointing.)

(C.) *Impression*.—(1) Normally functioning eighth nerves. (2) Intra-cranial lesion, probably left frontal lobe. (3) Consider lesion cerebral and not cerebellar. (*Note*—In addition to sending with the patient the above report, the following statement was written on the consultation sheet of the patient's record: "Cochlea, semicircular canals, and eighth nerves normal for both ears. Lesion of vestibulo-ocular tract on left side probably supra-nuclear. Mentality of patient prevents conclusion regarding integrity and function of vestibulo-cerebello-cerebral pathways. Impression that lesion is not cerebellar but in left frontal lobe.")

On 19th September the patient was irrational most of the time. An X-ray report on 20th September showed some decreased density in lower half of left frontal region; grooves of vessels in this region are rather prominent; otherwise findings negative. Eye consultation on

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21st September by Dr Henry B. Stevens recorded that visual fields show general contraction; papillitis of both eyes with some elevation of discs; hemorrhages on discs of both eyes, more marked in left eye; veins not markedly swollen or tortuous. On 24th September lumbar puncture and opinion by Dr J. B. Ayer indicated cerebro-spinal fluid, clear and colourless, pressure 250 mm., pulse and respiration movements present; cells, 0; protein (alcohol) total increased 68 mg.; globulin, 0 (amm. sulph.); fluid inconsistent with active syphilis, but compatible with brain tumour. Up to 26th September temperature, pulse, and respiration normal. Operation of left osteoplastic craniotomy for probable brain tumour of left frontal lobe was performed by Dr W. J. Mixer. The brain was somewhat tense; at junction of frontal and parietal lobes numerous adhesions of brain to dura; apparently a tumour beneath the dura mater; specimen taken with punch; area of bone removed to facilitate future X-ray treatment; subtemporal decompression. Wound was closed in layers.

Subsequent pathological report indicated two fragments showing on microscopic examination a tumour composed of atypical cells with mitotic figures of the glial type, *i.e.*, glioma. On 8th September wound clear, dry, and well healed; patient irrational, talks loudly and sings; as surgical condition did not prevent transportation, patient was transferred to the Psychopathic Hospital.

### 2. Case of Glioma of both Frontal Lobes.

(*Note*—A more detailed account of this case, with verbatim report of the clinical discussion, has already been published in the *Case Records of the Massachusetts General Hospital*, vol. viii., 14th February 1922, No. 7, part 1.)

M. G. P., female, white, married, age 38 (M.G.H., E.M. 246627), was admitted to hospital on 30th November 1921 when she complained of headaches chiefly occipital, associated with vertigo, nausea, and vomiting of five weeks' duration, and failing vision of three days' duration. Her family and previous history disclosed nothing of significance. She has had exceptionally good health until five weeks ago, when, after a drive in an automobile, she had an intense headache of sudden onset. Ever since that time she had continued to have dull, throbbing intermittent headaches accompanied by vertigo, nausea, and vomiting, occurring regularly every other day. They lasted about ten minutes, then cleared up for an equal interval and returned with severity, twice requiring morphia for relief. The headaches were chiefly occipital, although occasionally frontal and bitemporal, but not migratory. During the first few weeks there was no increase in severity. The headaches started about 3 A.M.,

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often waking her from sound sleep. They then continued intermittently until about 4 P.M. During the evening she felt fairly well again. They were generally non-radiating, though at times the pain did radiate up toward the vertex. She had been in bed most of the time during the past five weeks, except on the days of freedom from headaches, and she had been unable to work at all. During the free interval she felt tired and weak. From the time of the onset she vomited only on days when she had headache, and not when the headache was intense, but in the intermittent periods. The vomiting was usually accompanied by nausea, not definitely projectile and not related to meals. The vomitus was greenish, without sour taste or blood. Her dizziness had been most marked during the past week. She had not noticed any staggering. The back of her head was sometimes so painful that she could not lie on it. For the past two or three days her vision had been failing; everything appeared blurred.

Physical examination revealed temperature, pulse, and respiration normal; complete blood and urine examinations normal; Wassermann negative; stools negative; X-ray of skull normal; blood pressure 115/75; general physical examination negative; weight 200 lbs.; neurological details below.

Otological examination on 2nd December showed, tympanic membranes and hearing perfectly normal for both ears; static labyrinths normal: (1) The vestibulo-ocular reflex-arcs are intact and respond normally; (2) the vestibulo-cerebellar reflex-arcs are intact and respond normally; (3) the vestibulo-cerebello-cerebral reflex-arcs are intact and respond normally.

The first neurological consultation on 3rd December gave the impression of cerebellar tumour, because of presence of: (1) Choked discs; (2) questionable ataxia of legs; (3) occipital headaches; (4) occipital discomfort; (5) vertigo, lateral.

The second neurological consultation on 4th December resulted in the following diagnosis: Probably sub-tentorial lesion; neoplasm is most likely; the knee jerks are rather active; some reduplication on testing ankle clonus, but no sustained clonus; sudden relief of headache suggests possible blocking of it with relief; definite localisation I cannot make. The patient died on 8th December.

Hospital diagnosis was that of a brain tumour; history and physical findings suggested increased intra-cranial pressure; no signs or symptoms for the definite localisation of the lesion. At the clinical discussion before the post-mortem findings were disclosed the otological opinion was given that the lesion was not below the tentorium.

The anatomical diagnosis was that of glioma of the frontal lobes

## Verified Cases of Brain Tumour

of the brain. We were permitted to remove the brain only. The pituitary and pineal glands were normal. The brain weighed 1255 grams including the tumour weight. The convolutions of the convexity were flat and the vessels empty. The right side of the brain in the right fronto-parietal region bulged slightly. As far as sectioned, the left side of the brain up to the anterior margin of the anterior horn of the lateral ventricle was normal.

In the left frontal lobe, beginning in the region of the anterior margin of the corpus callosum and extending to a point about 2 cm. from the anterior tip of the lobe, there was a mass of new growth tissue, 5 cm.  $\times$  4 cm. consisting of grayish homogeneous rather soft tissue. It presented on the mesial aspect of the lower half of the lobe an irregular surface which was apparently continuous with the irregular surface of a grayish homogeneous rather soft mass of similar new growth tissue in the right frontal lobe. The mass in the right frontal lobe was a little larger and occupied about the same region as it did in the left frontal lobe. It was continued, however, as a mass of grayish homogeneous new growth-like tissue, slightly elastic, which extended into the region of the anterior part of the corpus callosum and along the brain tissue in the region of the lower end of the internal capsule, as far back as the anterior margin of the right optic thalamus. Its form roughly in this region was that of a columnar mass, 4 cm.  $\times$  2 cm. As far as dissected the brain elsewhere was normal. In this case it is unnecessary to make a detailed statement of the responses obtained from the caloric test; after-nystagmus, vertigo, nausea, falling and past-pointing were perfectly normal for both ears for both positions of the head.

### COMMENTARY ON SUPRA-TENTORIAL TUMOURS.

1. Each of these cases had normal hearing.
2. Each of these cases responded normally in every respect to stimulation of the static labyrinths.

### PART II.—DISCUSSION OF THE POINTS OF DIAGNOSTIC IMPORTANCE

Certain neurologists have stated that neurological examination is sufficient to differentiate between cerebral, extra-cerebellar, and intra-cerebellar tumours without the doubtful aid of the functional examination of the eighth nerve. They, therefore, seriously question the expediency of the minute, exacting, painstaking work entailed by the latter. Yet they admit their inability to make the diagnosis before the lesion has

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caused paresis of cranial nerves and damage, sometimes irreparable, to ocular function. They express the hope that otology may, in the near future, evolve a method of diagnosis of intra-cranial lesions in their early stages.

Some of the cases detailed above presented unmistakable clinical pictures independent of the otological examination. In some others it can be plainly seen that the otological examination was of distinct help in localisation. In one case, R. A., the functional examination of the ears resulted in the discovery of an organic intra-cranial lesion *before sufficient signs had appeared to warrant neurological diagnosis*. The functional examination of the ears in the reported cases has been of sufficient value to the surgeon to render it an imperative procedure before the serious step of intra-cranial exploration is undertaken.

But it cannot be too strongly emphasised that neuro-otological examination is not easy, and should never be undertaken in a haphazard spirit; nor can it be properly performed by every specialist in diseases of the ear, nose, and throat. It requires infinite patience, minute exact observation, heartless criticism of one's own behaviour and methods, and an accurate knowledge of the normal. It therefore requires an otologist of a scientific and investigating turn of mind. He must be able to differentiate accurately between the spontaneous and the induced phenomena. Our present knowledge of the physiology involved is so uncertain that, even when the observations made are correct, it is a difficult task to draw the logical conclusion.

This paper is essentially a presentation of facts and not of theory. One could therefore conclude at this point. The endeavour has, however, been made to evolve certain ideas from the observed facts which may be of practical help to those consulting otologists who are occasionally asked for help in the diagnosis of intra-cranial lesions.

With this end in view the observations on the functional examination of both divisions of the eighth nerve given in the above case histories have been tabulated to Table II. Careful consideration of these facts seemed to indicate that certain resemblances existed between the otological pictures presented by cases of brain tumour of the same general situation. These resemblances are recapitulated in the "comment" which follows each of the three groups into which the case histories have been

## Verified Cases of Brain Tumour

divided. The reader's attention is respectfully redirected to these comments. The latter have been somewhat schematically presented in Table III.

This graphic presentation may be stated in words as follows :—

1. The tumours of the frontal lobes did not interfere with cochlear or vestibular function.
2. The extra-cerebellar tumours affected homolateral cochlear and vestibular function.
3. Intra-cerebellar tumours did not interfere with cochlear function, but did interfere with vestibular function. The latter was affected more or less according to the size and situation of the growth; but it may be stated as generalisations that the interference tended to be bilaterally symmetrical, and that the functions of both vertical canal reflex-arcs were affected before those of either horizontal canal.

### PART III.—CONCLUSION

From Table II. the reader will see that some eleven different observations are made with regard to each ear.

Some authorities claim that from a careful analysis of the results so obtained one may deduce, with a fair degree of accuracy, the exact geographical localisation of even minute intra-cranial lesions.

The author does not lay claim to such skill, but is inclined, for the present, to take the more modest view that otological examination, carefully performed, can be of definite value in the differential diagnosis of cerebral, extra-cerebellar, and intra-cerebellar lesions. He considers that the cases reported above bring logical support to this contention.

The writer desires to express his sincere thanks to Dr Eugene A. Crockett, Chief of Staff at the Infirmary, for his encouragement in this investigation, and for his subsequent good offices in arranging with the Massachusetts General Hospital for permission to publish parts of the records.

TABLE I.—*General Survey of Cases.*

Type of Tumour.	Case.	Provisional Diagnosis.	Neurological Diagnosis.	Otological Diagnosis.	Final Diagnosis.	How Proven.
SUBTENTORIAL. INTRA-CEREBELLAR (5 Cases):—	E. G.	Brain tumour	Basal neoplasm	Intra-cerebellar tumour	Cholesteatomatous cyst of cerebellum	Operation, 12th May 1921.
	M. L.	Brain tumour	Brain tumour pressing on crura cerebri	Mid-line cerebellar tumour more on right side	Glioma of cerebellum	Operation and Autopsy.
	R. A.	Maxillary sinusitis	...	Organic intra-cranial sub-tentorial lesion	Intra-cerebellar tumour—right glioneuronal cyst	Operation, 21st January 1922.
	J. G.	Brain tumour	Cerebellar tumour	Intra-cerebellar tumour on right side	Irremovable cerebellar tumour on right side	Operation, 14th January 1922.
	L. F.	Brain tumour	...	Intra-cerebellar tumour	Tumour of pons and medulla	Operation, 9th January 1922.
SUBTENTORIAL. EXTRA-CEREBELLAR (3 Cases):—	F. A.	Brain tumour	Subtentorial tumour	Tumour of right cerebello-pontile angle	Neuro-fibroma of right cerebello-pontile angle	Operation, 3rd December 1921.
	M. N.	Brain tumour	Tumour of right acoustic nerve	Destructive lesion of both divisions of right eighth nerve in right cerebello-pontile angle	Cholesteatomatous cyst of right cerebello-pontile	Operation, 27th May 1921.
	P. W. M.	Brain tumour	Left intra-cerebellar tumour	Organic lesion of left side of pons	Plexiform angioma of left side of pons	Operation, 2nd December 1921.
SUPRA-TENTORIAL. FRONTAL LOBE (3 Cases):—	I. S.	Brain tumour	...	Cerebral—NOT cerebellar lesion	Glioma of left frontal lobe	Operation, 26th September 1921.
	M. G. P.	Brain tumour	Cerebellar tumour	Lesion NOT BELOW tentorium	Glioma of frontal lobe	Autopsy, 8th December 1921.
	E. G. P.	Diagnosis much in doubt. Encephalitis lethargica with kidney lesion	Tumour of left pontine region	Small lesion—possibly in left middle cerebellar peduncle	Adeno-carcinoma of kidney with metastasis in frontal lobe	Autopsy.
	G. S.	...	...	...	...	Operation.

\* Case not reported in detail.

† Case report much curtailed.



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TABLE II.—*Neuro-Otological Data of Cases in Detail.*

NAME OF CASE.		STATIC LABYRINTH.														
		Right Ear.						Left Ear.								
		Vertical Canals.			Horizontal Canals.			Vertical Canals.			Horizontal Canals.					
Right.	Left.	Nystagmus.		Nausea.	Past-pointing.		Nystagmus.		Nausea.	Past-pointing.		Nystagmus.		Nausea.	Past-pointing.	
		If Present, Normal or Abnormal.	Vertigo.		Right Arm.	Left Arm.	If Present, Normal or Abnormal.	Vertigo.		Right Arm.	Left Arm.	If Present, Normal or Abnormal.	Vertigo.		Right Arm.	Left Arm.
E. G.	.	N	N	+	+	+	+	+	+	+	+	+	+	+	+	+
M. L.	.	N	N	+	+	+	+	+	+	+	+	+	+	+	+	+
R. A.	.	N	N	+	+	+	+	+	+	+	+	+	+	+	+	+
* J. G.	.	N	N	+	+	+	+	+	+	+	+	+	+	+	+	+
* L. P.	.	N	N	+	+	+	+	+	+	+	+	+	+	+	+	+
F. A.	.	Abn.	Abn.	+	+	+	+	+	+	+	+	+	+	+	+	+
M. N.	.	N	N	+	+	+	+	+	+	+	+	+	+	+	+	+
P. W. M.	.	N	Abn.	+	+	+	+	+	+	+	+	+	+	+	+	+
L. S.	.	N	N	+	+	+	+	+	+	+	+	+	+	+	+	+
M. G. P.	.	N	N	+	+	+	+	+	+	+	+	+	+	+	+	+

Explanation of Signs :		N = normal.	O = absent.	dim. = diminished.	+	test not applied.
Abn.	= abnormal.					present.
x	= case not reported in detail.					

Explanation of Signs : N = normal, Abn. = abnormal, + = present, - = absent, dim. = diminished, case not reported in detail.

TABLE III.

	Name.	COCHLEA.		STATIC LABYRINTHES.			
		Right.	Left.	Right.		Left.	
				Vertical Canals.	Horizontal Canals.	Vertical Canals.	Horizontal Canals.
(a) Subtentorial Tumours :— (i.) Intra-cerebellar	E. G.	Normal	Normal	X	X	X	X
	M. L.	Normal	Normal	X	Normal	X	Normal
	R. A.	Normal	Normal	X	Normal	X	Normal
	F. A.	X	Normal	X	X	Normal	Normal
	M. N.	X	Normal	X	X	Normal	Normal
(ii.) Extra-cerebellar	P. W. M.	Normal	X	Normal	Normal	X	X
(b) Supratentorial tumours— Frontal lobes.	I. S.	Normal	Normal	Normal	Normal	Normal	Normal
	M. G. P.	Normal	Normal	Normal	Normal	Normal	Normal

X—Abnormal or absent.

## SOME CASES OF OTOSCLEROSIS SHOWING AN UNCOMMON SYMPTOM; OTOSCLEROSIS PARADOXUS.\*

By ALBERT A. GRAY, M.D., Glasgow.

IN the following short paper it is intended to describe a few cases which illustrate a condition which may be of interest to the otologist.

The condition referred to is that of patients suffering from otosclerosis, who hear better in circumstances in which the otologist would expect them to hear worse. The two first cases are similar, in that both heard better when suffering from acute catarrhal conditions in the nose.

CASE I.—Seen 11th November 1907. Mrs G., aged 44 years, began to be deaf at the age of 30, and a year or two later she was troubled with noises in the ears of a buzzing character and of considerable severity. Paracusis was very noticeable.

*Hearing Tests.*—Rinne: right ear - 10; left ear - 9. Schwabach: right, 6 secs. over normal. Watch: heard on contact only, in either ear. Whisper: right, 4 ins.; left, 5 ins. Conversation voice: right, 1 yd.; left,  $1\frac{1}{4}$  yds. High notes: slightly lost in both ears. Low notes: lost below  $so_{12}$  in both ears.

Inflation by catheter produced little or no improvement in either ear. The tympanic membranes were perhaps slightly indrawn in each ear, but not to any striking extent. There was no symptom of inner ear disease, and no history of deafness in the family.

The patient, when describing her case, referred to the fact that whenever she had a cold in the head she heard very much better. So much was this the case, that when the colds came on, she would keep saying to her friends: "Do not shout so loud." The fact was also strikingly evident to her friends themselves, so that they could speak to her in an ordinary tone of voice when she had a cold. The improvement in the hearing gradually passed away as the patient recovered from the cold.

CASE II.—Miss H., aged 41, was seen on 12th December 1916. Deafness began at the age of 25 years. Tinnitus was present in the left ear, but was not particularly distressing. Paracusis was present. Family history of otosclerosis was very strikingly present for the last five generations, and the patient was one of a family of three, of whom only one was not deaf.

\* Paper read at the Section of Otology, Royal Society of Medicine, 17th November 1922.

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*Hearing Tests.*—Rinne: right - 10; left - 15. Schwabach: right, + 8; left + 9. Watch: not heard in either ear, except on contact. Whisper: right,  $1\frac{1}{4}$  yds.; left, 6 ins. Conversation voice: right, 4 yds.; left, 1 yd. High notes: normally heard in both ears. Low notes: right, lost below  $fa_1$ ; left, lost below  $si_1$ . Tympanic membranes: right, rosy tint over promontory pronounced; left, rosy tint over promontory pronounced; neither membrane indrawn.

This patient suffered from hay-fever every year. She noticed that whenever the hay-fever began, her hearing improved strikingly. The fact was also clearly obvious to her friends. She noticed further that the improvement was greatest when the attacks were at their worst; that is, when the sneezing was most continuous and violent. The improvement always disappeared when the hay-fever passed off. It is interesting to note that an ordinary cold in the head did not, in her case, seem to produce improvement in the hearing in the way that the hay-fever did; but, on the other hand, she did not notice that the hearing became worse during a cold in the head.

These two cases are similar in respect to several facts. In both, an acute congestion of the nasal mucous membrane was present when the hearing improved, and, when the congestion passed off, the hearing again became duller. In both cases paracusis Willisii was a feature of the case. Bone conduction was prolonged in both cases, and tinnitus was present.

In the following two cases, which are also typical cases of otosclerosis, the improvement in the hearing occurred under conditions quite different from the two preceding cases.

CASE III.—This case was reported in the writer's work on otosclerosis,<sup>1</sup> but the incident to be recorded here had not occurred when that work was published.

On examining the hearing the following conditions were found:—

Right Ear.		Left Ear.
- 20	Rinne.	- 18
+ 10	Schwabach.	+ 8
3 ins.	Watch.	Contact only.
5 ins.	Whisper.	Not heard.
1 yard.	Conversation voice.	3 ins.
Slight loss of high notes.	Galton's whistle.	Slight loss of high notes.
Lost below $re_1$		Lost below $ut_5$

Both tympanic membranes were normal in appearance, and there was no rosy tint over the promontory. Inflation per catheter produced very slight and very fleeting improvement in the right ear. Tinnitus

# Otosclerosis showing Uncommon Symptom

was present with a moderate degree of severity. Paracusis Willisii was a feature of the case.

One evening the family were entertaining friends, but, of course, as may be gathered from the table above, the patient heard practically nothing of the conversation. It was rather a warm summer evening, and the room became overheated and the patient felt exhausted. She went over to the window and opened it, with the result that a comparatively much cooler draught of air surrounded her. She noticed at once an extraordinary improvement in her hearing. So much was this the case, that all the conversation became audible to her, clear and distinct. The sensation was, as she described it, "very uncanny." The condition lasted for about two minutes, and then passed suddenly off. It was as though "the cloud had come down again over her hearing." The patient had never experienced anything of this nature before, although the deafness had been in existence for many years.

In the next case, exactly the same phenomenon occurred, and in circumstances somewhat similar.

CASE IV.—Mrs R., aged 34, was seen on 31st October 1921. Examination of the hearing power revealed the following:—

Right Ear.		Left Ear.
- 5	Rinne.	- 7
+ 5	Schwabach.	+ 6
3 ins.	Whisper.	Not heard at all.
1½ ft.	Conversation voice.	6 ins.
High notes lost to a slight extent. Very many lost.	Galton's whistle.	High notes lost to a slight extent. Very many lost.
	Low notes.	

Tinnitus of a fizzing character was complained of, and was located in the head rather than the ears. Paracusis Willisii was present to a striking degree. Inflation produced a very slight improvement in the right ear, and the improvement passed off in a few minutes. Both tympanic membranes were normal in appearance. There was no known family history of deafness. The deafness began at the age of twenty-two years and was of very gradual onset. The patient was a strict teetotaler, a fact which may have some bearing on the case as will be seen later.

The phenomenon about to be described occurred in the summer of 1920, that is, about fifteen months before she consulted me. The patient with her husband and some friends went for a motor tour in Devonshire. One day they had a rather long run in the car, and the weather was very warm. On reaching the hotel in the afternoon, the patient felt exhausted and slightly faint, but did not actually faint. Her husband suggested that she should take some brandy, and she

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took about a dessertspoonful. In the course of a minute or two she noticed that her hearing had suddenly returned, and her husband and friends noticed the same fact, to their very great astonishment. According to her own statement and that of her husband, "she heard the conversation around her as well as she ever heard in her life." This condition lasted for two or three minutes, and then passed off as suddenly as it came. She has never had any experience of anything of this nature before or since. It is interesting to note, that acting on the persuasion of her husband and her friends, she tried the effect of a similar dose of brandy the following day, when she was not feeling exhausted or faint, but it had no effect on the hearing!

The last two cases are similar in many respects. In both, there was a sense of exhaustion when the incident occurred. In both, the surrounding atmosphere was hot and close, and probably therefore the superficial blood-vessels of the body were dilated; and in both, the improvement in the hearing occurred very suddenly, lasted for only a few minutes, and passed off as suddenly as it came. In neither case could the patient's imagination be associated with the condition, because it was as obvious to those around her as to herself. In neither case had the sensation ever been experienced before, though both patients had been deaf for many years.

As regards the literature of the subject, I have not been able to find any description of cases such as the four above described. Nevertheless I understand that one paper has been published describing a condition similar to, if not identical with the first two cases; that is, hearing better when the patient is suffering from a cold in the head. In a conversation which I had this year with Professor Mygind of Copenhagen, he told me that he had published a paper on this subject. I have not, however, as yet had an opportunity of reading the paper. Professor Mygind's experience in the matter, as described in conversation, is that this condition occurs only in true cases of otosclerosis, and that it is extremely rare. This coincides exactly with my own experience.

As regards the two cases in which the improvement in hearing occurred when the patients were feeling very exhausted, I know of no previous description of the condition. At the same time it is quite probable that some otologists have had similar cases under their observation, but have not thought it

# Otosclerosis showing Uncommon Symptom

worth while to publish them. Indeed, it was largely in the hope of hearing of similar cases in the experience of members of this Section that the present paper was written. For I am of opinion that the condition is of more importance than might at first sight appear; and, if studied carefully, it may help us to understand better that mysterious but very common affection, otosclerosis.

*Relationship to Paracusis Willisii.*—It will be noticed that in all four cases paracusis Willisii was a noticeable feature. Now the causation of paracusis has been discussed repeatedly but no agreement has been come to by otologists. My own opinion used to be that it was explained by the occurrence of movements of the stapes produced by loud sounds, enabling the sounds composed of smaller vibrations to reach the labyrinth. This explanation is accepted by many. But the cases just described have made me rather sceptical of such an explanation, for in them the improvement in the hearing occurred when there was nothing to cause such movement of the stapes or ossicles.

Another condition which may bear some relationship to that which is described in the cases above recorded, is the improvement in hearing which occurs in many cases of otosclerosis immediately after the inhalation of nitrite of amyl. The condition is very similar to that described in the last two cases, in that it appears suddenly, lasts for only a minute or two, and passes off as suddenly as it appears. Under the influence of nitrite of amyl the vaso-motor system undergoes a very sudden change; and it is very probable that in the last two cases described above, a similar change occurred. For, while both patients were feeling exhausted, a sudden stimulation occurred; in the one case a cool draught of air, and in the other the administration of a small dose of alcohol to an individual quite unaccustomed to it.

If, for convenience, a name is desirable for such cases as those described above, the writer ventures to suggest the name "otosclerosis paradoxus." For they are paradoxical in that the patients hear better when the otologist would expect them to hear worse, *i.e.*, when they are suffering from nasal catarrh or from exhaustion.

## REFERENCE.

<sup>1</sup> Albert A. Gray, *Otosclerosis: Idiopathic Degenerative Deafness*, p. 13, H. K. Lewis & Co., 1917.

## MALINGERING AND ALLIED CONDITIONS OF DEAFNESS.\*

By T. B. LAYTON.

FALSTAFF . . . it is a kind of deafness.

CHIEF JUSTICE. I think you are fallen into the disease ; for you hear not what I say to you.

FAL. Very well, my Lord, very well ; rather an't please you, it is the disease of not listening, the malady of not marking, that I am troubled withal.

*Henry IV., Part II., Act I., Scene 2.*

HAD Falstaff served in the late war he would have been called "a hoary old lead-swinger." That malingering is not the only form of the "malady of not marking" has been known since the time of the Psalmist, when he wrote of the "images of the heathen"—

"Eyes have they, but they see not. They have ears and yet they hear not."—Ps. cxxxv. 17.

I beg the courtesy of your listening for a short time this afternoon, while I try to analyse the various forms of this "kind of deafness."

### **The Maligner.**

The diagnosis of malingering is in three stages: in the first, the examiner realises that the behaviour of the person examined is unusual; in the second, he determines that this unusual behaviour is the result of malingering—that is, an intentional desire on the part of the examinee to make the examiner believe that his or her hearing is nil, or less than it actually is, in one or both ears,—in the third stage, he makes certain tests which he can reduce to writing, and whereby he can prove the intentional deceit of the examinee. Let us be quite clear on this last stage. Every case in which we decide that a person is a malingeringer, is one about which a report may have to be written, and, on this report, we may be cross-examined in a court of law. It is well, therefore, to write the report at once, and it must contain definite tests. These must include from the examiner certain definite instructions, and on the part of the examinee such responses as have resulted

\* Paper read at the Meeting of the Section of Otology, Royal Society of Medicine, 17th November 1922.



# Malingering and Conditions of Deafness

from, and can only have resulted from, those instructions. Unless we obtain such responses, we should not call a person a malingerer. We may be quite convinced in our own mind that he is one, but unless we have proved it we cannot say so. We may be entitled to refuse to give an opinion, we may state our belief that he is attempting to deceive, but without definite proof we cannot accuse him of malingering. Our opinion must be backed by evidence; it is not enough to say that from the behaviour of the patient we believe he is shamming. The behaviour of the deaf is often strange, and for this reason I lay great stress upon the difference between the first two stages in the diagnosis. It is most important not at once to assume that the strange behaviour of the examinee is due to malingering, we must wait and watch until we are almost certain that this behaviour can only be due to an attempt to deceive, and not to the effects of true deafness upon the mentality of the patient, or even of certain conditions of mind allied to, though not actually deafness.

## **The Functionally Deaf Person and Others.**

At the other end of the scale is functional deafness; my first knowledge of this I owe to Dr A. F. Hurst.<sup>1</sup> In these cases the otological examination gives no tests by which it can be distinguished from true organic nerve deafness. Dr Hurst has suggested that the vestibular tests give a means of diagnosis, and although we cannot say more than that his contention is "not proven," they are of value in enabling us to pick out cases in which recovery may result. Such a case happened this year at a Pensions Board; a man on whom I had reported as being quite deaf a year before, came up with normal hearing, the first sound that he had heard for over four years being the cry of his first-born. Many of these cases have been labelled "labyrinthine concussion," and there is a diminishing hope that some of such war deafnesses may even now recover. It was from Dr Hurst's writings that my notice was drawn to the subject of "attention," and I believe that it is by a study of this subject that we may classify our different types.

Between the two extremes of the "disease of not listening," already mentioned, are at least two other types. In the first place, there are certain men who suffered from severe shell shock. Such a man slouches into the room and flops into the chair, where he sits with vacant expression, with

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every possible muscle relaxed and with every joint in a position of rest. He seems to lack both interest and imagination; from this lethargy he can be roused with difficulty for a short time, only to relapse again as soon as the stimulus is removed; during the period in which he is aroused, his hearing appears to be normal.

The other is the subconscious malingerer; he is a person who has, or believes he has, some loss of hearing. He has no intentional desire to make the examiner believe that his hearing is less than it actually is, but he has some financial advantage in the examiner so believing it. He affords no help to the examiner, and his whole attitude appears to be against him. In the extreme types of this there is but a narrow dividing-line between him and the malingerer, and this dividing-line is not recognised by some people, but I believe the cases form a distinct type.

### On Attention.

Ribot<sup>2</sup> has classified attention into spontaneous or natural attention and voluntary or artificial attention. The two would seem to correspond respectively with what are now called the subconscious and the conscious parts of the mind. Of the former he writes: "Spontaneous attention is the only existing form of attention until education and artificial means have been employed. There exists no other kind in most animals and in young children. It is a gift of nature, but very unequally distributed among individuals. . . . Man, like animals, lends his attention only to what concerns and interests him." (Pp. 12-13.) Of the latter he says: "Voluntary attention is an adaptation to the conditions of a higher social life; it is a discipline and a habit, an imitation of natural attention." (P. 45.) Though I am not sure that I agree with all he says about them, I think Ribot's subdivision into two forms of attention is a useful one, but I want to bring to your notice three other points with regard to it. Attention would seem to have a negative as well as a positive phase; thus it is not only possible passively not to attend to a thing, but also actively to exert inattention towards it; it is possible to "switch off" from a subject, to put it aside, and to refuse to allow it to come uppermost; this is partly done by turning the attention to something else, which brings me to my second point, that our total amount of attention is limited. The more

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attention we give to one thing the less we can give to another at the same time. Lastly, though attention is an attribute of the mind as a whole, it has subordinate parts such as visual or auditory attention or an introspective attention associated with memory.

From the time of Darwin<sup>3</sup> or before, attention has been recognised as being associated with the contractions of muscles, voluntary or involuntary, and, as with other forms of muscular activity, it is apt to tire. These points are well seen in the behaviour of children, in the way they will be absorbed in a game or a book and never hear something spoken directly to them, and yet will at once catch something that affects them which they are never meant to hear; and also in the way in which it is hard to fix the attention and how it goes again when it is fixed. In adult life the more primitive conditions of the mind are obscured by many other things, yet we must all have experienced that state in which something said is quite unheard by one who is conscious and with normal hearing—a state well described by Keats when telling a friend what happened to him in the lecture theatre at Guy's. "The other day during the lecture, there came a sunbeam into the room, and with it a whole troop of creatures floating in the ray; and I was off with them to Oberon and Fairyland."<sup>4</sup>

## Attention and Deafness.

To return to our "kinds of deafness." It has been suggested that the pathogenesis of functional deafness is explained by the withdrawal of attention.<sup>5</sup> I think this is a reasonable hypothesis, but we must postulate that it is auditory attention only that is removed. These persons in other ways are very alert, they will often respond to some movement or sign of which the speaker is unconscious, and the examiner may feel convinced that this response can only be in answer to the spoken word, and may thereby dub him unjustly a malingerer.<sup>6</sup> Dr Hurst has suggested that the diagnosis can be made from organic nerve disease by the caloric test; that this remains positive in the cases of functional disease, but that in cases of complete organic nerve deafness the vestibular nerve is also destroyed. I am not prepared to say that the latter is always the case, but it has proved so in cases of complete deafness from cerebro-spinal meningitis, from a blow on the mastoid, or from a gun-shot wound involving the ear which

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I have carefully examined; and I believe that in any case of complete deafness of both ears, due to the war, in which the caloric test is positive, recovery may still be possible.

When the deafness affects one ear only, and the caloric test is positive, I strongly suspect functional deafness; but I do not know of any case in which recovery has taken place. I attribute this to the extreme difficulty of excluding the hearing in the unaffected ear. The patient always listens with that ear, hears with that ear, and believes that he hears with it. Hence it is impossible so to stimulate the affected ear that he knows he has heard in it. We cannot, therefore, make him believe that he will hear again, nor can we even raise in his mind the hope of returning hearing. This problem is well worthy of note, for there must be many such cases among ex-service officers and men.

To pass to the cases of severe shell shock, in which I believe the whole attention is diminished. It seems as though the synapses of the nervous system had all become extremely resistant to the passage of any message—afferent or efferent; as though when these were goaded into action, they let the messages through for some period of time during which the patient hears normally. The treatment of these cases must be, and usually is, in the hands of the mental expert rather than the otologist, but they raise an interesting point. How far is the removal of attention a factor in our cases of advanced deafness from middle-ear catarrh and allied conditions? Many such patients seem to wrap themselves up in themselves, shunning the outer world of other people. In many cases—I would suggest—a material part of their loss of hearing is a loss of interest in the external, a loss of the power of listening, a loss of attention either auditory or general. If this is so, we should always try to do something for our patient when we can do nothing for his hearing, and treatment must be directed towards his behaviour in life as much as, if not more than, to his ears or their use.

In these two types, both the spontaneous and the voluntary attention are withdrawn. In the subconscious malingerer the voluntary attention only is in abeyance and is merely withdrawn, it is not in opposition. The spontaneous attention is still active, and, if this can be approached without the use of the voluntary attention, it is not hard to find the true state of hearing. I believe this to be the state in which Keats was

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in the lecture theatre, in which John Hunter was when Reynolds caught his far-away expression, in which we are during a sermon when we hear not a word of it, but rise with the congregation at its close. And I believe it is the frequent condition of school children of both sexes, and of any type of school. It is very hard to test the hearing of a child, everything is against one; the child is unable to grasp the instructions one gives, is unable to switch from one train of thought to another, and, above all, he relapses into a state where it appears that he simply won't hear. The story of the school teacher that a child is deaf must never be taken for definite evidence, it may mean that the teacher is unable to interest the child; and this is especially likely to be the case when the mother gives the history, that she has to speak half a dozen times to the child before it answers, but that he or she hears fast enough when she says to the father something which she does not mean the child to know. The matter is of importance not only in deciding upon the operation for adenoids, but also on the wider problem of deciding how many children should be taught in a class by one teacher, and, in extreme cases, it might be a reason to recommend individual tuition, in whole or in part, for a child who was not developing the voluntary attention, either owing to slight deafness or from mere scatter-brains.

In the true malingerer the voluntary attention is not merely withdrawn, it is also in opposition. It damps down the spontaneous attention and prevents one using it unless it is possible to "catch him out," that is, to make use of the spontaneous attention through the screen of voluntary attention in opposition to it. Where the subconscious malingerer ends and the true malingerer starts depends upon how much and where the will comes in. In the former case no will-power is exerted to help the examiner; the examinee does not listen but he does not try NOT to listen; in the latter, he listens intently but tries hard NOT to respond naturally, and the degree to which he tries is a measure of his malingering. It is in a person such as this that we realise how much attention is wrapped up in the neuro-muscular system. The deaf man who has given way to his disability so that he has given up trying to hear, or the shell-shock man who has lost all interest in life, sits down with his whole muscular system relaxed, the body habitually assumes the symmetrical position of rest, the

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spine curves forward, the shoulders are rounded, the forearms hang listless across the thighs, the neck shortens as though the head telescoped into the body, the jaw muscles relax and the face becomes expressionless, while the eyelids droop. Not so the malingerer: he sits upright in the chair with the eyes fixed to the front, shoulders square with hollow back, head erect with eyes well open, fist closed or hand gripping the thigh; motionless except for the slightly deepened breathing. "Totally suppress movements," says Ribot (p. 25), "and you totally suppress attention." If one substitutes motor activity for movements, he is right; but all the best examples of attention are statuesque in their cessation of motion—the cat watching a hole, the guards' platoon, the hare about to bolt, and some children watching their dinner being served.

### Some Physiological Points.

From the point of view of our work for the Ministry of Pensions the important thing has been to distinguish this last class of case from the others; but before discussing more fully the diagnosis of the malingerer, I would draw attention to certain physiological points that must be borne in mind in association with it.

In all tests of structures conveying different impulses to the brain, we have to rely upon motor action to learn the results of our stimulus. For this the integrity of the reflex arc is essential.

The best test would be that in which a single reflex only is involved; even then the matter would be complicated. Sherrington in introducing the subject of "the principle of the common path" says: "A reflex detached from the general nervous condition is hardly realisable." He<sup>7</sup> shows how stimuli may be severed or combined and how reflexes may be allied or antagonistic, even in a test where a reflex only is used. All these factors may modify the response to a given stimulus, but in all our tests a mental process is necessary on the part of the person tested, before the examiner can observe the motor action upon which he estimates the effect of his auditory stimulus.

Every variation of all parts of the mental process involved may alter the response, and of these variations attention will account for many, but not for all.

In testing the sense of hearing, the stimulus most often used is the sound of the human voice, and the motor response some

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spoken word. No test can be devised which would involve a greater amount of the nervous system, and the margin of error varies with the amount of the thinking processes brought into play in framing the response. The reactionary period differs immensely between different persons and in the same person. Thus the time taken to repeat a spoken word varies enormously in different people, and also in the same person according to his physical fitness, the presence or absence of some other disease, or the degree of his fatigue. But in a series of such tests with the same person and in the same state of health the time taken to reply will also vary according as any subsequent test deals, or does not deal, with the same train of thought as does the preceding one.

A series of figures may be repeated at once, the names of a series of substances associated in thought, such as articles of food, will not be repeated so quickly, and if the examiner is able to think of a series of words quite unassociated one with another in thought, the person being tested may be quite unable to repeat them.

We have then two factors, the physiological one of the reactionary period which will be constant in one person, whether the motor response is to repeat a word or to escape from a painful stimulus; and the mental one involved in passing from one subject to another. Whether the latter is a development in our evolution from the former I know not. I am inclined to believe that the one does not necessarily vary with the other; but we must be careful not to allow an unusually long reactionary period, physiological or mental, to be mistaken by us for a voluntary or subconscious desire to deceive on the part of the examinee.

It is, perhaps, a matter for discussion whether or not attention should be included in our concept of hearing, but I think that all will agree that these two factors are distinct from attention and should be excluded from such concept. I am of opinion, however, that deafness weighs more heavily upon those whose minds are less agile either in the uptake or reply.

## **The Detection of the Malingerer.**

To lay down rules for the detection of a malingerer is impossible, and to describe tests for the same is futile. For the test used with one person may be useless with another

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within the same hour, and no single test is diagnostic. We can only make notes for the conduct of the examination during the third of the stages outlined above. Now the conduct of the malingerer is of two parts. On the one part, it is the acting of a man doing what he believes a deaf man would do under like circumstances. On the other part, it is the behaviour of a man under great mental strain.<sup>8</sup> This strain is intense and constant, with a great desire of relief from it. Time is on the side of the examiner. The examination then must never be hurried; for as time goes on it is harder to act, and the strain becomes greater. And, if the examiner has been unsuccessful in getting his evidence, he may remember that as the examination is finished so the examinee feels the relief from his strain and ceases to act; and in that moment the evidence may be got.

The examiner has to make the man do that which by nature he would do; but which he is straining by acting not to do. Now, when a man is cheating, he suspects that he is suspect, and the examiner by his conduct and manner must do all he can to allay this suspicion, and when it is allayed he must take care not to rouse it again. To accuse the man of cheating until full evidence has been got, is, therefore, fatal. It is but to confirm his suspicions and to put him more upon his guard. So also any sign of impatience or of any rising temper makes the task more hard; for by the sharpness of a touch or the alteration of the tone of the voice, the examinee may be warned of the anger, and may thereby have more control over his own actions. It is for this reason that the presence of a third person makes things more hard; and yet it is well that a third person should always be present, that he may subscribe to the report a note as to the accuracy of the observations. But he should take no part in the proceedings, unless he is so asked by the examiner. He must keep still and quiet, and it is better if he also pretends to take no interest in the proceedings. Just as the examiner has allayed all suspicion, just as he has finished certain obvious tests and is about to apply some test which the examinee thinks not to be a test, the movement of a foot upon the floor, the rustle of a newspaper or the opening of a door, may again rouse the suspicion, and make it necessary to start the whole again.

It is seldom that a report can be strong enough unless



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each ear be tested separately. It is hard to exclude the hearing of one ear. This is so, even when the other ear is deaf or partially so and the examinee is honest, it is more so when the hearing in each ear is normal and the examiner is honest; but when the examinee is also dishonest it is most so, for in some subtle way the method used to exclude the hearing in his one ear will also warn him and enable him constantly to remember that he is acting.

Each examiner will use his own tests which are suitable to his nature, and which he has practised; one will use the watch, another the tuning-fork, some the human voice and others a tinkle or a noise. But all such tests should be of two kinds, that, whereby the examinee thinks he is being tested, and that which the examiner actually uses. It is not wise to make an examiner employ a test to which he is not used, for even with his own he may be wrong.

## Appendix.

The following are copies of two reports written by me at an interval of three months, after I had had three years' experience of the work.

I am unable to explain the discrepancy. I suspect that in a case of functional deafness there may be some sub-conscious power of hearing at certain times, whereby a man may give the appropriate motor response without ever appreciating that the sensory impulse has reached his brain.

### REPORT, DATED 2nd AUGUST 1922.

The man is a malingerer. When made to stand in the corner for ten to twenty minutes with the finger in his ear he remained there all the time without altering his position, and he said afterwards that he had heard nothing, in spite of the fact that noises such as the slamming of doors had been going on, and he had previously been answering questions given in the low voice. Subsequently he described a certain noise as being that caused by hitting a nail, and when asked in the quiet spoken voice at 18 ft. distance, how many knocks, he held up three fingers in response, his back being turned to the speaker. So also with the left ear, he says he cannot hear a loud sounding fork in it, but when the same fork was put without his knowledge near this ear, and a silent one on his head, he said he heard it towards the left side. This test was repeated, but he refused to admit any other hearing. Drum-heads opaque, otherwise normal.

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He is a partial reader of the lips, but considering he has had eight months' instruction in it, he is an extraordinarily bad one. He practically never gets the words spoken correctly when they are articulated without phonation, and when he does, it is only the simplest words in the sentence. One ear was good; the other had some hearing.

REPORT, DATED 8th NOVEMBER 1922.

The man entered the room in an alert manner. He at once put his hat and parcel on a chair, and when I told him to take off his coat, he started to do so, then ceased and buttoned it up again. This may have been a coincidence or in response to an unconscious sign on my part.

When care is taken to keep to the same subject of conversation he can read the lips very well, it is only when a new train of thought is raised that he finds a difficulty.

I could find no evidence of hearing to-day. He does not hear the tuning-fork in the ear, when a silent one is on his head. He hears no loud noises and does not give the impression that he is malingering. On syringing either ear with cold water he develops a nystagmus to the opposite side. I think I have done this man an injustice in my report dated 2.8.22, and that he is really deaf. I think it must be a case of functional deafness, and that it may be curable.

N.B.—Lt. ———, M.C., of the Disabled Society, attended during the examination. He told me that he has known the man for over twelve months, and that his behaviour this evening was the same as in ordinary circumstances.

### REFERENCES.

<sup>1</sup> *Scale Hayne Neurological Studies*, vol. i., p. 279, and *The Psychology of the Special Senses*, Chap. VIII.

<sup>2</sup> Ribot, *The Psychology of Attention*, 1890.

<sup>3</sup> *Expression of the Emotions*, Chaps. XII. to XIII.

<sup>4</sup> Colvin's *Life of Keats*. "English Men of Letters Series," pp. 15, 16.

<sup>5</sup> Hurst, *loc. cit.*, Supp.

<sup>6</sup> See case recorded in Appendix.

<sup>7</sup> "Integrative Action of the Nervous System." Lecture IV., para. 1.

<sup>8</sup> Vide *The Road to Endor*.

## SOCIETIES' PROCEEDINGS

### ROYAL SOCIETY OF MEDICINE—SECTION OF OTOLOGY

November 17th, 1922.

*President*—HUNTER F. TOD, F.R.C.S.

*Chairman*—SIR CHARLES BALLANCE, K.C.M.G.

**Some Cases of Otosclerosis showing an Uncommon Symptom** (Otosclerosis Paradoxus)—Dr A. A. GRAY. (See *Journ. of Laryngology*, March 1923, p. 141.)

#### DISCUSSION.

Mr J. F. O'MALLEY said Dr Gray apparently was not convinced as to the accuracy of the generally accepted explanation of paracusis; he, like so many more, had accepted it as true. It was difficult to find evidence that the stapes was the responsible factor. The idea had occurred to him, the speaker, that the condition of the perilymph might be a factor of importance, and he would like to hear whether Dr Gray considered that an alteration in the perilymph—especially as to its quantity—would be likely to be a factor in the causation of paracusis. Years ago he read, in an old book, reports of examinations in which labyrinths were devoid of fluid after death. There were certain peculiarities associated with some of these cases which would lead to the belief that there were changes in the labyrinthine fluids, and these changes must have a considerable influence on the hearing.

Mr RICHARD LAKE regarded the communication as a very interesting one. He remembered certainly one case in which the patient heard much better during a cold, but he did not remember particulars of it. It was possible that the improvement might be a toxic one, *i.e.*, the stimulus to better hearing might be a toxin evolved in the catarrh. He had still under cognisance a deaf-mute, who could hear very slightly. A few years ago she had post-influenzal pneumonia, and during the time she was practically *in extremis* in that illness, she heard better than she had ever done before. The suggestion he made to her father at the time was, that it must have been due to the toxæmia she was suffering from in her illness. Children in a toxæmic condition—if they were not really stupid—had a very acute cerebration during the illness; and Dr Gray's patients might have had a toxæmia at the time, though of mild form, and the stimulus might have acted not only on the nerve endings, but also on the central nervous system.

Mr VLASTO thought it would be a more scientific attitude to accept the facts communicated to Dr Gray by his patients as correct. It would be serviceable if members searched their memories and records for cases of otosclerosis in which the deafness was improved under varying conditions.

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He asked if Dr Gray had heard of a case of otitis media sicca in which the hearing was improved during an attack of coryza.

Sir JAMES DUNDAS-GRANT said it was interesting to remember, in this connection, the observations which Sir Robert Woods brought forward at Paris. Sir Robert observed that during or after acute inflammation the deafness in otosclerosis sometimes seemed rather less marked, and he devised a method of injecting some irritant fluid through the tympanic membrane. One case was described in which the result seemed to be promising. This indicated that the increased vascularity, even if it were only temporary, was the agent in the production of the improvement of the moment. Patients had told him (Sir James) that they heard better when they had a cold, and he had not paid sufficient attention to it, but he would attach significance to such statements in future. Dr Gray's patients seemed to have heard a conversational voice much better than they heard a whisper, but in otosclerosis the patient not infrequently heard the whisper better; in fact, that was being recognised as one of the signs of otosclerosis. Perhaps he (the speaker) had used in the test a more penetrating whisper than Dr Gray did, giving the high-pitched harmonics of the voice more prominence.

With regard to paracusis, he asked whether Mr Cleminson had pursued the observations with the apparatus demonstrated at the last meeting by Mr Somerville Hastings, which seemed to prove the reality of paracusis more certainly than anything he had encountered. Experiments made in other ways had been open to doubt as to whether the patient actually had better hearing, or whether there was unconscious raising of the speaker's voice caused by the noise which was heard by the speaker.

Mr CLEMINSON said Mr Somerville Hastings had scarcely been available since the last meeting.

Remembering the beneficial effect of nitrite of amyl, Mr Cleminson tested a female patient with otosclerosis with the watch and found she could hear with the right ear, 3 inches, with the left, 2 inches. Then he applied a Seigle's speculum and produced a negative pressure until he could see not only the vessels along the handle of the malleus, but also the radial vessels from the malleus handle to the periphery of the drumhead. At this stage he found she could hear the watch with the right ear, 10 inches, and with the left, 3 inches. He continued to test her every minute afterwards and found the duration of the improvement was three to five minutes, after which she relapsed into the state in which she was before the experiment began. That seemed to support the view that the improvement was due to a vascular change.

Mr W. M. MOLLISON said he did not doubt that an increased peripheral vascularity had an effect on the hearing. Women often noted that they became worse after the birth of each child, but just before parturition they heard better; at such time the circulation was enormously enhanced, and there was a more vigorous circulation in the ear. The fact that patients heard better when they had a cold might also be due to enhanced peripheral circulation. Otosclerotics also improved when given pilocarpin.

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Mr G. J. JENKINS said the problem introduced by Dr Gray was a very far-reaching one, too large to deal with adequately in a few minutes. At the International Congress in 1913, he tried to show that probably some of the symptoms of otosclerosis were due to changes in the labyrinthine fluid, and he used a hot-water douche for the ears of patients with otosclerosis, beginning with water of body temperature and going up to quite a high temperature. For a short time after this hot douche patients heard better. The effect of chloroform on the hearing of patients suffering from otosclerosis should be remembered, so too, individuals with normal hearing had increased acuity of hearing with certain doses of chloroform. He knew of a doctor, suffering from otosclerosis, whose habit was to take chloroform before starting his round, although the effect only lasted about an hour at a time. Also, paracusis patients heard better during yawning, possibly by effecting the labyrinthine fluid.

Mr TILLEY reminded members that the stimulation produced by Sir Robert Woods was induced by the injection of an iodine preparation into the middle ear.

Dr GRAY (in reply) agreed that, in its broad application, the subject was a large one; but the purpose of the present paper was to secure interest in this particular phase:—the better hearing in otosclerosis when there was present an abnormal condition, such as a cold. It had always been the custom to think of otosclerosis as being due specially to fixation of the stapes, and he regarded that as a fundamental error, as the fixation of the stapes was only one manifestation of the disease. The change in the bony capsule of the labyrinth was an atrophic change. He believed otosclerosis to be a disease of the whole organ of hearing, from the auricle to the cortex.

In answer to Mr O'Malley as to the perilymph, he (the speaker) did not know whether there was more, or less, perilymph than normal in otosclerosis. With regard to Mr Lake's point concerning toxæmia, that was a very interesting matter, because it was true that many toxins did produce an effect on the vaso-motor system; the shivering and heat at the beginning of scarlet fever or measles was due to the effect of the toxin on the vaso-motor system. The same explanation might be true in the case of pilocarpin, as that drug also produced a marked effect on the vaso-motor system. He had never known this condition occur in ordinary chronic otitis media: it occurred only in otosclerosis.

He remembered Sir Robert Woods' contribution in Paris: he injected iodine into the middle ear in chronic otitis media. Otosclerosis might have been present too. The speaker thought the effect was more likely to be due to stimulation of the mucous membrane of the tympanum, and there was probably a reflex dilatation of the blood-vessels in the labyrinth.

With regard to the suction of the tympanic membrane, mentioned by Mr Cleminson, in that case the effect might have been due to dilatation of the blood-vessels in the labyrinth; but when the stapes was fixed, it was difficult to see how that could occur. Unless the stapes were movable, any suction on the tympanic membrane would be compensated for by air coming up through the Eustachian tube. If, however, there was some obstruction in the Eustachian tube, it might occur. Another explanation

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was that there might be stimulation of the nerve endings in the tympanic membrane, with coincident dilatation of blood-vessels in the labyrinth. The same explanation would apply to Mr Jenkins' warm douche.

The important point was, that one could not look upon the deafness of otosclerosis as being due only to the mechanical fixation of the stapes. A fixed stapes was a constant factor, and if the deafness was due to that, nothing in the way of dilatation of the vessels would produce any effect. It was much more likely that in these cases there was a reflex dilatation of the blood-vessels when nasal catarrh was present. He thought the statements made by the patients in these cases were obviously true; in the case he described first in the series, he knew it was true; it happened in the case of a distant relation, and he had been present when she had a cold, and there was no doubt about the striking difference in the hearing during the cold.

**Malingering and Allied Conditions**—T. B. LAYTON. (See *Journ. of Laryngology*, March 1923, p. 146.)

### DISCUSSION.

Dr FRIEL said he thought that in examining pensioners it was important to see whether the appearances of the drum corresponded with the results of the functional tests. If the appearances in the drum corresponded to the functional tests, it tended to show that the responses of the patient were correct.

Mr VLASTO remarked on the omission from Mr Layton's paper of a reference to day-dreaming. This occupied a place of much importance in the child's life, and during its sway the young person was oblivious of all that was going on around. In the adenoid child one of the distant receptors—audition—was partly in abeyance and a vicious circle was thus set up.

Mr G. J. JENKINS regarded the paper as a very interesting one indeed. All individuals were non-listeners: non-listening was a physiological process, and the Rinne and Weber tests depended upon this fact to some extent. A girl came to King's College Hospital one day with complete deafness in one ear. She had to sleep in a house where there were many rats, and next morning she was unable to hear at all with one ear. Weber went to the sound ear; in the good ear the hearing was normal. There was no sign of disease and the caloric test showed she had normal vestibular reaction of the labyrinth of the deaf ear. He asked her if she would come into the hospital and have it put right next day, and this led to hesitation and questions as to whether she would be operated on, or hurt. There was something more than pure hysteria in the case. The case is under further investigation. But the point he wished to insist on was, that we were all non-listeners; all were "not listening" at every moment of the day, and it was an exaggeration or aberration of this normal physiological state, which in many cases was responsible for functional deafness.

Sir JAMES DUNDAS-GRANT said that he had frequently noticed, in dealing with deaf soldiers, that sometimes there was a very high degree of deafness accompanying a slight, removable cause or condition, and

# Ear

when that was removed, the great improvement in the hearing was out of proportion to what one was accustomed to see in civil practice. In some cases, one successful Eustachian catheterisation altered the aspect of the patient altogether: he brightened up at once and took a totally different view of life. Similarly, tightening up a relaxed membrane by means of collodion would do it, as also the removal of nasal obstruction. Therefore, the deafness in those cases was not due alone to organic changes, the psychical factor playing a large part.

With regard to caloric tests, he thought, with Dr Hurst, that if there was absence of vestibular reflex, the deafness should be put down as of organic origin. The converse, however, was not always true: although the vestibular reflex might be present, the deafness might be organic. He thought there was a greater degree of vulnerability of the acoustic part of the nerve than of the vestibular.

Dr A. A. GRAY said he believed Falstaff's words were:—"This apoplexy, I take it, is a kind of deafness," which voiced the idea that there was an association between apoplexy and deafness.

## ABSTRACTS

### EAR.

*Local Anaesthesia in Aural Operations.* GUNNAR HOLMGREN.  
(*Acta Oto-laryngologica*, Vol. iv., fasc. 3.)

This paper refers especially to local anaesthesia in mastoid and other major operations on the ear. A short historical survey is followed by a detailed description of the author's technique. A hypodermic injection of morphia or pantopon is given half an hour before the operation. A 0.5 per cent. novocain-suprarenin solution is injected subcutaneously from two sites, the upper a couple of centimetres above, and the lower two or three centimetres below, the attachment of the pinna. From each of these points about 10 c.c. are injected in front of the ear and 10 to 15 c.c. behind it, in such a way that "it embraces the whole field of operation in every direction as a coherent mass." Moreover, "one must manage so that the mass spreads outside the air-filled area of the temporal bone, that the lower part of the temporal muscle and the tendon of origin of the sterno-mastoid and its uppermost part are also infiltrated, and that the infiltration is also made in the place for the skin incision." After this, a syringe is inserted exactly behind the wall of the meatus and directed upwards, inwards, and backwards so as to strike the bone of the supra-meatal spine where 5 c.c. are injected. A similar quantity is injected exactly in front of the meatus, the point of the syringe in this case being directed so as to strike the root of the

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zygoma. After an interval of five to ten minutes the soft parts and bone are found to be completely anæsthetic. The antrum, tympanic cavity, and Eustachian tube are anæsthetised by the application of a 40 per cent. solution of cocain in suprarenin (1-1000) which produces a quite satisfactory, though not absolute anæsthesia.

During the year 1921, in the Sabbatsberg clinic 84 major operations on the ear were performed under local anæsthesia, including 34 Schwartze and 40 radical mastoid operations. During the first three months of 1922, of 124 major operations, 64 were done under local anæsthesia, one of them being a translabyrinthine operation for acoustic tumour. All children under fifteen years of age of whom there were 36 in the first quarter of 1922, were operated on under general anæsthesia, so that in adults local anæsthesia was actually used in nearly 85 per cent. of the cases, and has become the standard method. The chiselling gives rise to some discomfort, but this is minimised by proceeding slowly and using sharp chisels and a wooden mallet. Nervous patients are soothed beforehand by the promise that general anæsthesia will be at once induced if they call for it during the operation, but during the past six months no such request has been made.

Great stress is laid on the advantage of the comparatively bloodless field, given by local anæsthesia, and on the fact that the functions of the facial, auditory, and vestibular nerves can be tested during the operation. The author believes that the introduction of the modern methods of local anæsthesia in otological surgery constitutes the greatest step forward during the last decade.

THOMAS GUTHRIE.

*Streptococcus Hemolyticus Mastoiditis.* A. M. DUNLOP.  
(*Laryngoscope*, Vol. xxxii., No. 10, p. 733.)

A series of 15 cases are carefully recorded, all requiring a simple mastoid operation. Some of the cases were bilateral. The source of infection, an inflammation of infective and epidemic type, was in the throat and nasopharynx. The characteristic features of the mastoiditis were (a) absence of definite signs, *i.e.*, no mastoid tenderness, no sagging of the meatus, (b) rapidity of sequelæ in untreated cases, (c) no rise in temperature till after operation, (d) a profuse serous discharge, perhaps the most characteristic sign, (e) moderate leucocytosis count, 12,000-16,000, (f) pure or predominant cultures of streptococcus hæmolyticus from the mastoid cavity. There are three post-operative stages (1) profuse serous discharge, followed by (2) profuse mucopurulent discharge and abundant granulations (3) less mucous discharge and less active or even flabby granulations. The streptococcus persists in the wound for a very considerable time



# Pharynx

after operation, and in the one fatal case the meningitis occurred one month after the mastoid operation, and no portal of entry could be found. The post-operative stage is also characterised by a swinging temperature which gradually settles down. A bacteriological examination of the discharge is urged in all cases.

ANDREW CAMPBELL.

*Two Cases of Intracranial Complications of Acute Ear Disease.* PETER MACDONALD, M.D., and J. ACOMB, M.B., B.S. (*Brit. Med. Journ.*, 9th September 1922.)

CASE I. was influenzal in origin, with bilateral ear symptoms occurring in the first week; in the right ear, deafness, otorrhœa, and mastoid tenderness; in the left, deafness and mastoid tenderness without discharge. The right optic disc was slightly swollen—the left was doubtful. The right mastoid was opened, showing inflammation and granulations in the cells, but no pus; the left membrane was incised. The general condition improved, but the swelling in the optic discs increased. After a week a rigor occurred, and the right sigmoid sinus was explored with a needle, liquid blood being drawn off; the right jugular vein was exposed but appeared healthy. The temporo-sphenoidal lobe was explored with no result. The left mastoid was then opened and sinus thrombosis was found. Improvement again occurred and continued for three weeks, still with the eye symptoms unchanged, and then drowsiness and lethargy ensued. A further operation was arranged for, but before it took place a copious discharge of pus occurred in the right mastoid wound, apparently from a temporo-sphenoidal abscess, and the patient made an uninterrupted recovery.

CASE II. was one of long-standing intermittent otorrhœa with symptoms pointing to sinus thrombosis. The sinus was found to contain liquid pus and the same condition was found in the jugular vein. The latter was followed down to the clavicle but the lower limit of the pus was not reached. Streptococci were found in the pus and also in the patient's blood. Antistreptococcus serum and autogenous vaccine were used and the patient made a good recovery.

T. RITCHIE RODGER.

## PHARYNX.

*A Case of Diphtheria complicated by Hemiplegia with Aphasia.*

H. GORDON SMITH. (*Lancet*, 1922, Vol. ii., p. 382.)

Patient was a girl aged 6. Diagnosis confirmed by a "positive swab." Antitoxin was given. She progressed satisfactorily until the fifteenth day, when difficulty in swallowing and a nasal voice occurred. Next day,

## Abstracts

vomiting and cyanosis occurred. Improvement took place forty-eight hours later. On the twenty-third day, complete right hemiplegia with aphasia developed. Patient discharged about three months after the commencement of the illness. She had regained some power in the leg and arm, and her speech was improving slowly. The heart was normal.

MACLEOD YEARSLEY.

### *The Antitoxin Treatment of Diphtheria of the Throat.*

VALDEMAR BIE. (*Acta Medica Scandinavica*, Vol. lvi.)

As the result of many years of observation and research on this subject, the author has come to the following conclusions:—(1) The effect of a dose of antitoxin, large or small, on the temperature in a case of diphtheria is nil. (2) The tendency for diphtheria to affect the larynx and trachea, less and less, during the last ten years, cannot be ascribed entirely to the introduction of antitoxin, but rather to a modification in the type of the disease. (3) The administration of antitoxin hastens the disappearance of membrane, but only to a slight degree (average nine days reduced to seven). (4) A great advance has been made in the treatment of very bad cases, by administering, by intramuscular or intravenous injection, large doses of antitoxin—e.g., 160,000 to 220,000 units in first twenty-four to thirty-six hours, thereby (a) entirely avoiding death as a consequence of paralysis of respiration; (b) reducing death-rate in these severe cases to less than one-third of former rate.

J. B. CAVENAGH.

### *Infection of the Pharynx by a Watch.* PHILIP H. HILL.

(*Lancet*, 1922, Vol. ii., p. 508.)

Male, aged 32, in an attack of acute delirious mania during pneumonia, tried to destroy himself by swallowing a watch. He was cyanosed, struggling violently, and in great distress. The finger passed into the pharynx felt the watch lying transversely. Owing to the man's violence it was impossible to dislodge it by the finger in the bow, or by curved forceps. During the attempt, the heart failed suddenly and the man fell back dead.

MACLEOD YEARSLEY.

## LARYNX.

*Laryngitis due to Zinc Vapour.* CURT NURNBERG. (*Archiv f. Ohren-, Nasen-, u. Kehlkopfheilkunde*, Bd. 109-11, 1922.)

Nurnberg describes a severe form of laryngitis occurring in a carpenter who worked over a room in which iron articles were dipped into hydrochloric acid and then into liquid zinc. Ventilation of the room, which was detached from the main factory and was being only

## Miscellaneous

temporarily used for the process, was suspended owing to shortage of fuel for the engine which drove the electric fan. The patient did not smell any fumes from the acid, with which he was familiar, and to which he was very susceptible. There was no question of diphtheritic infection.

The onset of the laryngitis was severe, cedema of the glottis being threatened. A membranous inflammation of the true and false vocal cords, with swelling and discoloration of the epiglottis, arytenoids, and surrounding parts left fine granulations in its train, healing being completed in six weeks. Injections of 10 per cent. Ol. Menthol gave much relief in the early stages of the affection.

Nurnberg summarises the literature of affections of the upper respiratory tract caused by zinc, ulceration and necrosis in the nose being most frequently recorded. Zinc may be found in the urine of these patients, but its appearance is inconstant, so that it is not a reliable diagnostic feature.

WM. OLIVER LODGE.

### *A Case of Joint Affection in the Larynx with Gonorrhœa.* NILS RHODIN. (*Acta Oto-laryngologica*, Vol. iv., fasc. I.)

The author was able to find records of only eight cases of gonorrhœal arthritis of the larynx. He describes a case of his own in which the left crico-arytenoid joint was affected, there being marked swelling of the left ary-epiglottic fold and arytenoid, with complete fixation. No other joints in the body were involved. The condition cleared up quickly under intravenous injections of gonargin.

THOMAS GUTHRIE.

## MISCELLANEOUS.

### *Calcium Chloride in Cocaine Poisoning.* F. FAERY. (*Münch. Med. Wochenschrift*, Nr 26, Jahr. 69.)

The full record of a case of severe cocaine poisoning in a female patient aged 19, in which the theoretical deductions of Mayer, based on his experiments on animals, are fully confirmed.

The patient exhibited all the classical symptoms of cocaine poisoning, and in spite of the usual restoratives her condition was rapidly getting worse. Yet, within two minutes of making the injection, and before 2 c.cm. of the prepared solution of calcium chloride had been injected intravenously, a distinct and striking improvement was noticeable in the patient's condition.

JAMES B. HORGAN.

## OBITUARY

HUNTER F. TOD, M.A., M.D., B.Ch. (Cantab.), F.R.C.S. (Eng.)

President of the Section of Otology, Royal Society of Medicine ; Senior Surgeon to the Ear, Nose, and Throat Department, London Hospital ; Lecturer in Aural Surgery, London Hospital Medical School.

THE death of Mr Hunter Tod on 13th January, at the early age of fifty-two, following a long and distressing illness borne with great courage, has not only left a gap in the ranks of British Otologists which it will be difficult to fill, but it has also caused a severe blow to a large number of friends and colleagues who held him in the most affectionate esteem.

Hunter Tod was born in 1871, the second son of the late Mr David Tod, J.P., of Eastwood Park and Hartfield, Renfrewshire, N.B. He was educated at Clifton College and at Trinity College, Cambridge, and received his medical training at the London Hospital. In 1892, he took the degree of B.A. (Cantab.) with First Class Honours in Natural Science, followed, in 1896, by the M.A., M.B., B.Ch. (Cantab.), and the M.R.C.S., and L.R.C.P., London. His career at the London Hospital as a student was a successful one, for he won the Surgical Scholarship in 1895, and was House-Surgeon under Sir Frederick Eve, and House-Physician under Sir Stephen Mackenzie. In 1898, he received the diploma of F.R.C.S. (Eng.), and, in 1907, the M.D. (Cantab.).

Having determined to take up Aural Surgery as a specialty, he started by studying for a year at Halle, following which he became Resident Medical Officer to the Throat Hospital, Golden Square. This was followed by a further and prolonged course of study at Leipzig, Vienna, and Berlin. Returning to London in 1901, he was appointed Assistant Aural Surgeon to the London Hospital, and, a few months later, he became Surgeon to the Throat and Ear Department at the Children's Hospital, Paddington Green. Within two years he was appointed Aural Surgeon to the London Hospital, which appointment he held up to the time of his death, his term of office having been extended as a special honour.

At the time of his death he was President of the Section of Otology, Royal Society of Medicine, and Lecturer in Aural Surgery in the London Hospital Medical School. He had been Examiner in Aural Surgery to the Royal Army Medical College, and a Member of the Special Aural Board of the Ministry of Pensions.

When he commenced his career at the London Hospital, scientific Otology, as understood at the present day, did not exist, and it was his enthusiasm, perseverance, and energy which placed the specialty—in

## Obituary

that hospital—in its present flourishing and scientific position. In this respect Otology owes a great debt to him.

Besides a large private practice, Hunter Tod had a wide circle of friends who deeply mourn his untimely end. To his patients he gave great confidence and encouragement, which could be attributed to his sound knowledge and skill. To his friends and acquaintances his cheery optimistic character will always be remembered with the most affectionate regard, for, wherever he went, he shed a brightness and happiness amongst those with whom he came in contact.

All who have had the opportunity of watching his work were impressed with his acumen, and with the manipulative skill which he displayed. As a diagnostician his opinion was not only welcomed, but sought after by a wide circle of the profession.

One of his colleagues writes:—"Of Hunter Tod's judicious and eminently practical mind we find ample evidence in his contributions to the literature of Otology, especially in those giving the results of his experience in the Surgery of the Ear—of the intracranial complications of middle-ear disease. Only a few months before his untimely death he published some of the results of his wide experience of lateral sinus thrombosis. He showed that the high percentage of recoveries depended firstly on the early recognition of this, at one time, invariably fatal complication. His keenness for organising and improving the teaching of aural surgery, with the object of promoting more efficient treatment for patients suffering from ear disease, was well known within and without the walls of the London Hospital. Not only did he press for more beds for aural patients, and for the compulsory attendance of students so that they should become acquainted with the methods of overcoming the risks and dangers of neglecting ear diseases, but he also urged his confrères in other hospitals to do the same."

He was the first to perform and exhibit in this country a case of submucous resection of the nasal septum.

Hunter Tod was an enthusiastic and prominent Freemason. W. Bro. William Hill, P.G.D., says that Hunter Tod was initiated in the Isaac Newton Lodge when an undergraduate at Cambridge, nearly thirty years ago; he joined the Earl of Mornington Lodge on coming to London; subsequently he was a Founder, P.M., and Treasurer of the London Hospital Lodge and of the old Cliftonian Lodge, and he was a Founder and P.Z. of the Public Schools Chapter. On the occasion of the special Grand Lodge Meeting at the Albert Hall last October, when the Prince of Wales was invested Senior Grand Warden, Bro. Tod was given the rank of Past Senior Grand Deacon, and he was made Past Principal Sojourner Grand Chapter. He had acted as Steward to all the Masonic Charities.

An old University friend and colleague writes:—"I knew him

## Obituary

first as an undergraduate at Trinity College, Cambridge, and afterwards as a student at the London Hospital. It is difficult in a few words to give an adequate picture of his most attractive personality. Small in stature but very neatly built, he played half back at Rugby football for Trinity, and for the London Hospital, and played a most fearless and aggressive game. He was exceedingly good company, and his air of impish—I had almost written impudent—self-assurance, was chiefly put on to raise a laugh. He was fundamentally entirely devoid of ‘side.’ ‘Jinks,’ as all his friends affectionately called him, was interested in every side of life. If one day his tutor had to censure him for his participation in a ‘rigger rag,’ he would be congratulating him very shortly on his ‘first’ in the Tripos. Although he achieved great professional distinction, due to his intellect, industry, honesty and personal charm, he always remained ‘Jinks,’ the light-hearted jester to his old friends.”

By many of his confrères in the West End he was known by perhaps the more dignified sobriquet “the Hunter.”

Viscount Knutsford (Chairman of the London Hospital) adds the following tribute to his memory:—“I have known him ever since he first entered the Hospital when he got a surgical scholarship in 1895, and during the whole of that time Hunter Tod was peculiarly noted for his extraordinary patience and gentleness. He was a particularly good mastoid operator—so his colleagues have often told me—and he took a personal pride in lessening the painful after-dressings. It may seem to be an exaggeration to say that everybody loved him, but I have no words to convey my feelings. He faced his death as he faced everything in life, with cheerful bravery and pluck.”

A colleague at the London Hospital writes:—“When one has been the intimate friend of a man for over thirty years—and has, moreover, grown up and graduated successively with him through the stages of Student, Resident, and Staff—it is difficult in a few words to do justice to a man like Hunter Tod. As a student ‘Jinks,’ as he was universally known, and will always be affectionately remembered, was the life of his year. Brimming over with high spirits and vitality, in work and in play alike, he knew and showed the zest of living. Possessing a brain of remarkable quickness, unusually retentive memory, and surprising powers of concentration, examinations had no terrors for him, and his Hospital career continued the brilliance of his University days.

“As a Hospital Resident his colleagues will never forget his indefatigable cheeriness and unfailing high spirits, and looking back one sees how the irresponsible student developed apace as he shouldered life’s responsibilities. There never could be any doubt that ‘Jinks’ would succeed in whatever he undertook, and his gaiety failed to cloak an earnestness which always commanded success. Tod



HUNTER F. TOD, M.A., M.D., B.Ch. (Cantab.), F.R.C.S. (Eng.)





## Obituary

did nothing by halves. When he meant work, nothing would tempt him away; at other times, he would slack and play as to the manner born. He early showed marked surgical abilities, and threw himself whole-heartedly into the special branch of Surgery which he made his life work. He was a rapid, expert operator—to see him do a ‘mastoid’ was to watch a master of his craft. As a Staff colleague in later years his enthusiasm for his Department was unbounded, and he was always fighting for its improvement. He was whole-hearted in his methods, and spared neither friend nor foe. But we all loved him. ‘Jinks’ leaves a blank we shall find it very hard to fill.”

Another colleague at the London Hospital writes:—“Hunter Tod was connected with the London Hospital for close on thirty years. He came here as a student on leaving Cambridge. After a short time on the Assistant Staff he served as Senior Aural Surgeon for twenty years, and had just had his term of office extended for another five years, and there also he died! He was thus in every sense a ‘London’ man, and his affection for the Hospital, and his loyalty were amongst the mainsprings of his life. His zeal for his own Special Department was unbounded, and he was tireless in his efforts to extend its scope, and promote its efficiency; indeed, his incessant demands for an increase of beds became almost a standing joke between him and his colleagues when the members of the Staff met in Council. Others are more competent to speak of his skill as an operator in his chosen branch, but as one who only came in professional contact with him in consultation over cases on the boundary-line between Medicine and Surgery, the writer can testify to the general trustworthiness of his opinion, and the soundness of his judgment. Yet it is probable that he did not always get full credit for his extensive and accurate knowledge. Like one of the characters in *The Wrong Box* he thought that there was ‘nothing like a little judicious levity.’ This humorous way of looking at things along with a certain flippancy of manner, at times tended to conceal from those who did not know him well, his great reserves of clinical experience. But it was just those characteristics which endeared him more to his colleagues and friends. Never was there a more clubbable man, or one who could be better company, and everyone knew ‘Jinks’—from the Chairman to the most junior porter. He derived from his Scottish birth a dry sense of humour, and a gift of delicate sarcasm, whilst his English education had smoothed away the surface asperities apt to be met with in those who come from North of the Tweed. Scottish also in his sincerity of speech and deed, he was almost too honest to please some type of patient, and if his outspokenness occasionally gave offence in debate he was always the first to smooth any ruffled feelings, and never cherishing a grudge. Like many little men, Hunter Tod had a great and courageous heart, and those who were privileged to witness the bravery with which he

## General Notes

awaited the slow-footed approach of inevitable death, recognised that he was indeed—in the words inscribed on the wreath laid on his grave by his colleagues—a very gallant gentleman, whose untimely removal has cast a gloom over the Hospital he so greatly loved.”

The *Lancet* referring to his distinguished career, says :—“It is not as a great pioneer, but as a teacher and practitioner of Aural Surgery, with a lovable personality, whose work and example did much to raise and nothing to lower the highest ideals of his profession, that he will be remembered and missed.”

He was the author of a manual of *Diseases of the Ear*, published in 1907, and he contributed articles on “Diseases of the External Auditory Canal and Tympanic Membrane” in Clifford Allbutt’s *System of Medicine*, 1908; “Operations upon the Ear” in Burghard’s *System of Operative Surgery*; “Acute Inflammation of the Middle Ear” in Latham and English’s *System of Treatment*, 1912; “Diseases of the Tympanic Membrane, Adenoids, and Nasal Obstruction” for the *Practical Encyclopædia of Medicine and Surgery*.

He leaves a widow, the eldest daughter of Dr Stanley Rendall, of Chantmerle, Aix-les-Bains, a son and three daughters.

A Memorial Service was held at St Marylebone Parish Church on the 26th January, which was attended by Viscount Knutsford (Chairman of the London Hospital), who read the Lesson, and by many of his colleagues on the Staff of the London Hospital. There was also a large and representative gathering of his specialist colleagues, and many members of the nursing profession.

IRWIN MOORE.

## GENERAL NOTES

ROYAL SOCIETY OF MEDICINE,

1 Wimpole Street, London, W.1.

*Section of Otology*—Chairman, Sir Charles Ballance, K.C.M.G. *Hon. Secretaries*, F. J. Cleminson, M.Ch., and Archer Ryland, F.R.C.S. Ed. The next Meeting of the Section will be held on Friday, 16th March, at 5 P.M.

Members intending to show cases or specimens are requested to give notice of the same to the Hon. Senior Secretary, Mr F. J. Cleminson, 32 Harley Street, London, W.1, at least twelve days before the date of the Meeting.

*Section of Laryngology*—President, Charles A. Parker, F.R.C.S. Ed. *Hon. Secretaries*, T. B. Layton, D.S.O., M.S., and J. F. O'Malley, F.R.C.S. The Annual Meeting of the Section will be held on Friday, 4th May, at 4.45 P.M.

## General Notes

Members intending to show cases or specimens are requested to give notice of the same to the Hon. Senior Secretary, Mr T. B. Layton, 10 Welbeck Street, London, W.1, at least twelve days before the date of the Meeting.

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### SUMMER MEETING OF THE SECTION OF LARYNGOLOGY, MANCHESTER, June 1923.

The Annual Summer Meeting of the Section will be held at Manchester on Friday and Saturday, 15th and 16th June.

Papers will be read and discussed on the morning of the 15th, and Clinical Cases will be demonstrated in the afternoon. On the morning of the 16th, further papers will be read and the Meeting will close at 1 P.M. unless it should be found necessary to adjourn the sederunt until after luncheon.

All who are interested in Laryngology will be cordially welcomed.

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A Conjoint Meeting of the Tuberculosis Society of Scotland and the Scottish Society of Otolaryngology will be held in the Hall of the Royal Faculty of Physicians and Surgeons of Glasgow, 242 St Vincent Street, on Saturday, 10th March, at 11.30 o'clock.

The subject arranged for discussion is "The Diagnosis, Prognosis, and Treatment of Laryngeal Tuberculosis."

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### BRITISH MEDICAL ASSOCIATION, PORTSMOUTH, 1923.

The Ninety-first Annual Meeting of the British Medical Association will be held at Portsmouth in July, under the Presidency of Mr Charles P. Childe, F.R.C.S., Senior Surgeon to the Royal Portsmouth Hospital. The President will deliver his Address on the evening of Tuesday, 24th July, and the Sectional Meetings for scientific and clinical work will be held on the following days.

Mr Ernest B. Waggett, D.S.O., M.B., Ch.B. (London) has been elected President of the Section of Laryngology and Otolaryngology.

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The American Laryngological, Rhinological, and Otolaryngological Society meets at the Hotel Ambassador, Atlantic City, on 10th, 11th, and 12th May 1923. Dunbar Roy, M.D., Atlanta, Ga., President. William H. Haskin, M.D., New York City, Secretary.

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The American Otolaryngological Society meets at the Hotel Ambassador, Atlantic City, 14th and 15th May 1923. George E. Shambaugh, M.D., Chicago, President. Thomas J. Harris, M.D., New York City, Secretary.

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The American Laryngological Association meets at the Hotel Ambassador, Atlantic City, 16th 17th and 18th May 1923. Emil Mayer, M.D., New York City, President. George M. Coates, M.D., Philadelphia, Secretary.

## General Notes

The Section of Laryngology and Otology of the American Medical Association meets in San Francisco, 25th June 1923. William B. Chamberlain, M.D., Cleveland, Ohio, President. Samuel Iglauer, M.D., Cincinnati, Secretary.

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The American Academy of Ophthalmology and Oto-laryngology meets in Washington, D.C., October 1923. Thomas Carnody, M.D., Denver, Colorado, President. Luther C. Peter, M.D., Philadelphia, Pa., Secretary.

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### ELEVENTH INTERNATIONAL CONGRESS OF OTOTOLOGY AND LARYNGOLOGY. COPENHAGEN, 1925.

The arrangements made by our Danish colleagues in connection with this Meeting are well advanced. The Congress will be held on Monday, Tuesday, and Wednesday, 3rd, 4th, and 5th August 1925. We understand that these dates have been decided upon in order to suit the convenience of the English-speaking members of Congress.

An International Congress of Ophthalmology will be held in London from 21st to 24th July of the same year, and as the Annual Meeting of the British Medical Association usually takes place during the last week of July, the sequence of events will enable colleagues from the Overseas Dominions, from the United States and South America, who may so desire, to attend the three Meetings.

\* \* \*

Professor Harvey Cushing in his Presidential Address upon "The Physician and the Surgeon," delivered before the American College of Surgeons at Boston, on 27th October 1922, makes a brief reference to his recent short service at St Bartholomew's Hospital as *locum tenens* for Mr George Gask, F.R.C.S.

In commenting upon the training of the medical student, he says: "I have had a most illuminating experience which has left me with the impression that the British student receives a more practical clinical course, based upon much better training in anatomy and gross pathology, than do most of our students, and that he is far less inclined to lean upon laboratory accessories in making his diagnosis. He, for a longer time, and more intimately, is brought into contact with the 90 per cent. of human ailments upon which complicated laboratory tests have no special bearing, and through practical experience he is able to arrive at a reasonably sound conclusion in regard to his patient's disorder and to have a shrewd idea of the appropriate form of treatment. True, he may miss some of the more rare conditions, for which, after all, little can be done therapeutically—conditions which our students, with their vastly better laboratory facilities, might recognise in all likelihood. But if we were to put, side by side, at work in a small town, the average product of these two methods of teaching, I am inclined to think that the former would be the more resourceful, and would exercise greater wisdom, though possessed perhaps of less learning. And after all, the strength of a profession, as of a nation, is represented by its average product."

# The Journal of Laryngology and Otology

(Founded in 1887 by MORELL MACKENZIE and NORRIS WOLFENDEN)

## THE AIM AND USE OF SPECIAL HOSPITALS.\*

By Sir SYDNEY RUSSELL-WELLS, M.D., F.R.C.P., M.P.

HAVING been for nearly twenty years a member of the Senate of the University of London, and recently become its Vice-Chancellor, I have constantly had occasion to consider how the various parts of that vast organisation, and the scattered institutions in London concerned with cognate matters, can best contribute to the primary objects of a University—the making and distributing of knowledge, and the raising up of learned men in the various Faculties to serve the community. As a result of this, I have reached very definite conclusions regarding the function of special hospitals and the part they are called upon to play in the future.

Medicine is so vast a subject, and has grown so greatly both in extent and complexity, that specialisation is inevitable. It is no longer a question whether specialties are desirable or not, but rather how they can be best learnt, taught, and practised. I will not enter into the debatable grounds of what constitutes a specialty; suffice it to say that certain branches of medicine, such as Diseases of the Throat, Nose, and Ear, Diseases of the Eyes, Skin, Nervous System, Diseases of Women, have in practice come to be so considered, and that there is every reason to suppose that the number of these specialties will increase rather than diminish with the progress of medicine; indeed, in recent years urogenital diseases and cardiology are coming to be special subjects.

There are two main schools of thought: some consider

\* Speech delivered at the Annual Dinner of the Central London Ear and Throat Hospital, 26th October 1922.

## Sir Sydney Russell-Wells

that special subjects are best taught and dealt with in the special departments of general hospitals; others look to special hospitals more particularly to deal with their needs; for myself, I consider that both are necessary, that they perform distinct functions and cater for different requirements. So far as the sick poor are concerned, I have no doubt that they are adequately, skilfully, and humanely treated both in our general and special hospitals. We can, therefore, concentrate our attention on the two other objects a hospital should serve—viz., teaching and the advancement of knowledge. In teaching, the primary needs to be considered are those of the student; the best teaching in the world is of no avail if it is given at times or places or under such conditions that no students can attend.

In medicine there are two classes of students—the undergraduates and the graduates. The undergraduate must of necessity be studying several subjects at the same time, and one must assume that he has no previous knowledge of what he is learning. A proper balance must be kept between the various parts of the curriculum, and rudimentary and fundamental principles must be insisted on and constantly reiterated. The proportion of time allotted to any specialty should bear some proportion to the frequency with which cases of it occur in general practice. Because every branch of medicine has bearing on others, it is well that the student's knowledge of each should be advancing simultaneously: a half day once a week for six months at a particular specialty is, therefore, much better at this stage than twelve whole days on end. On account of the saving of time, it is far better that all departments should be under one roof; further, for the student just commencing a subject, the teaching must almost necessarily be didactic in character. For undergraduate teaching, it seems to me that the arguments in favour of dealing with the specialties in special departments of general hospitals are overwhelming, except in the case of such subjects as infectious fevers, where other considerations enter in.

When we come to post-graduate teaching, practically all the arguments are in the other direction. Post-graduate students may be divided into two main classes—those in general practice who are anxious to improve their acquaintance with some particular subject or subjects, and to bring their knowledge up to date; and those who, having qualified, are

# The Aim and Use of Special Hospitals

desirous of studying with a view to becoming specialists. Neither of these classes can be well taught together with undergraduates; the attempt has frequently been made, and has never been successful. The whole character of the teaching required is different. The reiteration of elementary points becomes wearisome to the post-graduate, didactic teaching is resented, and the dwelling upon commonly occurring cases, so essential to the undergraduate teaching, is boring to the qualified man who has seen hundreds of them before and only wants to see them again when they illustrate new observations, new methods of treatment, or exemplify unfamiliar points of view. The rarer cases, naturally, have for him a disproportionate interest, and, from his previous experience, he is able to concentrate his attention on them without warping his outlook. In the same way, he often feels that controversial subjects, half proved theories, and individual points of view are more stimulating than the beaten track.

It is comparatively rare to find post-graduates, bent on serious study, who are anxious to range over the whole field of medicine; as a rule, there are special parts that more particularly interest them or in which they feel their knowledge deficient. Further, time is an important factor; it is much easier for a man in active practice, unless he resides in the immediate neighbourhood of the hospital, to take a holiday of a fortnight or so for study than it is to come up to town, say, every Thursday afternoon for six months; consequently, short intensive courses of a fortnight, all day and every day, have been proved at the Heart Hospital to be far more popular than longer and more leisurely ones; but such courses demand many teachers. They can easily be undertaken by the full staff of a special hospital, but are impossible in the special department of a general one, since this is usually under the charge of one man, with possibly an assistant. Moreover, the slightly different outlook which is bound to exist between the different members of the staff of a special hospital, is found by the post-graduate to be more suggestive, and to give a fairer view of new work than the authoritative teaching of the single head of a department.

The vast clinical material of many of our special hospitals enables the commoner cases to be rapidly dealt with by clinical assistants, while the teacher is able, at practically every sitting, to show cases of the less ordinary conditions; while the excellent

## Sir Sydney Russell-Wells

practice at some of the special hospitals of all the physicians and surgeons seeing out-patients, and all having beds, enables cases to be discussed which have been watched by the same observer, it may be, for several years. For the man in general practice who desires to keep himself up to date, short intensive courses at special hospitals are ideal. For the practitioner who desires to specialise, clinical assistancies are the desirable course.

With regard to the advancement of knowledge, to the really great man, the truly original thinker, it matters little whether he works in a special department or a special hospital; but what are the relative advantages and disadvantages to those of us who are formed of more ordinary clay? The head of a department in a general hospital has the advantage of working in touch with men concerned with other branches of medicine. The tendency for his subject to loom too large in his mind is constantly being corrected, and changes in other branches of medicine and their bearing on his own are repeatedly brought to his notice; in his own subject he is largely a solitary worker. Compare the consultations at a general hospital with those at a special one, and the difference is striking. In the former, the specialist is the authority so far as his specialty is concerned, while in the latter, frequently a most stimulating and interesting discussion takes place. In a general hospital a specialty is only a small part of a great whole; in a special hospital it is the be all and end all of the institution. The staff consists of a team of specialists, each urging the others on to increased efforts, each contributing his own quota, each influencing and modifying the views of all. An atmosphere is created which makes for growth, the buildings are arranged with the peculiar needs of the particular class of cases in view, the board of governors think in terms of the specialty; hence when new equipment, new and often expensive apparatus or the like, are required, there is no weighing of the claims of various departments—a most important matter in these days of increasing cost and growing science.

The arguments, to my mind, all tend to show that undergraduate teaching should be practically entirely done at general hospitals, and post-graduate teaching and work at the special hospitals. If this is so, what a great responsibility, what a great opportunity, lies before institutions such as this. The undergraduate teaching of medicine in London is probably as



# The Aim and Use of Special Hospitals

good as, and possibly better than, any in the world, while post-graduate teaching on a scale worthy of the capital of our great Empire is almost non-existent. It is, as would be said across the water, "up to" the special hospitals to provide it. Sometimes, in my dreams of the future, I see a great square with, ranged round its sides, the special hospitals of London, each with its own staff and board of governors, each with its own autonomy—for I regard amalgamation of such diverse subjects as likely to sacrifice more than would be gained—but all in a friendly alliance to constitute the greatest post-graduate school in the world. Each should have its own small lecture-room, for classes should, and probably would, be small, and the instruction as far as possible individual. Each would have its own laboratories and special library, but there might also be a great hall and students' common rooms, etc., common to all, with possibly a small registration and publicity staff. That, however, is only a dream of the future, and while the grass grows the horses starve.

Can we do nothing now? Personally, I think we can; the clinical material exists, the staffs exist, buildings, though very far from adequate, exist, and post-graduate students exist. The tentative endeavours we have made at the Heart Hospital show that each intensive course which we have held, has been better attended than the last, and we are attracting men from Australia, from Canada, from the United States, from Vienna and Paris, as well as from our own country. Cannot the special hospitals form among themselves a federal post-graduate school? The cost would be very small; the amount of work entailed need not press too heavily on any individual, if all are agreed to do their share and recognise that it is not only their duty to practise, but also to teach, their specialty. While I think general amalgamation neither possible nor desirable, amalgamation in one subject, such as has taken place between the orthopædic hospitals, may well be advantageous; but it should come about freely from within, and not be imposed from without as part of a great scheme which is really quite an independent matter. Personally, I believe that while others are talking about it, the special hospitals, by a little co-operation, could without assistance from outside form what would, in a comparatively short time, constitute the London Post-graduate School. Once it were established, if those concerned threw themselves into it with a will and taught regularly and

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taught well, it would soon gain credit, and outside assistance would come in, but at first it would have to depend on ourselves alone.

I have such a high opinion of the work you are doing, and I know so well the spirit and enterprise with which the staff of your hospital is animated, that I felt I could not put forward these ideas in a more congenial assembly. If ever such a school as I have adumbrated is formed, I am sure that your hospital will be one of its important parts, and one of its greatest ornaments.

## AN UNCOMMON TONSILLAR APPENDAGE AND ITS RELATIONSHIP TO CARTILAGE FORMATION IN THE TONSIL.\*

By A. LOGAN TURNER, M.D., F.R.C.S.E., and  
THOMAS SPRUNT, M.B., Ch.B.

FOR many years the occurrence of cartilaginous nodules in the tonsil has been a matter of common knowledge. Since the condition was first described by Orth in 1893, it has been a subject of widespread interest, and many cases have been published. We venture to record the following case on account of the unusual appearance which the tonsil presented. We acknowledge our indebtedness to Mr E. D. Dalziel Dickson, F.R.C.S.E., Capt. R.A.M.C. (S.R.), who operated upon the patient and sent us the tonsils for examination.

The patient, an adult male, was admitted to the 82nd General Hospital, Constantinople, for removal of the tonsils. Both structures were hypertrophied. On the left side a finger-like process, attached apparently near the lower pole of the tonsil posteriorly and hanging free, passed downwards into the pharynx. It had not been previously observed by the patient and had not caused any uncomfortable sensation in the throat, nor did it induce coughing or a desire to swallow. The right tonsil showed no similar abnormal structure. Both tonsils were enucleated with the guillotine.

The naked-eye appearance of the enucleated left tonsil, covered with its capsule, is seen in Fig. 1. The appendage, somewhat constricted where it leaves the tonsil posteriorly, becoming broader in the middle part and again narrowing towards its free end, measured 2.6 cm. in length and 0.7 cm. in its greatest transverse diameter. On section (Fig. 2) a distinct line of demarcation is seen between the appendage and the tonsil itself, while small nodules of cartilage can be readily recognised upon the cut surface.

**Histology of the Appendage.**—Serial sections of the tonsils were made; the histological appearances seen in the sections were similar in both tonsils. The latter were considerably enlarged as the result of hyperplasia, but they showed no

\* Communication made to the Section of Laryngology, Royal Society of Medicine, 1st December 1922.

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active inflammatory change: no evidence of cartilage formation was found in the substance of either tonsil.

The appendage attached to the left tonsil was cut in serial sections and stained with Mallory's connective tissue stain, with hæmatoxylin and eosin, and also with Weigert's stain for elastic tissue. Under the low power, the specimen was seen to consist of a central core of loose connective tissue of a vascular adipose type. At the attached end of the appendage the core passed into the tonsil to unite with the connective tissue at its base, giving the impression that this tissue had passed down along with the cartilage from that area.

Many blood-vessels were distributed in the fibro-adipose core, and several irregular islets of cartilage lay in a broken chain extending from the upper to the lower pole of the appendage. As revealed by serial sections, the islets were distinct and separate, and their varying number at different levels was probably due to their irregular or wavy outline (Fig. 3).

As the core approached the periphery of the appendage, the connective tissue became denser and the fat cells disappeared. At this point lymphoid cells made their appearance, at first as a few scattered lymphocytes, but eventually forming definite follicles under the epithelial covering (Fig. 4). The zone of lymphoid tissue completely invested the appendage, except where the connective tissue core passed into the tonsil. An epithelial covering devoid of crypts enveloped the whole surface of the appendage.

Under the high power the islets of cartilage were well shown by means of Mallory's stain (Fig. 5). They were very cellular and possessed a scanty matrix. The cells were irregular in size and in distribution. Those near the centre of the islets were the largest and contained vesicular nuclei, while towards the periphery they were much smaller and closely packed together. The matrix of the cartilage was traversed by interwoven fibrils apparently of a fibrous nature, and staining blue with Mallory. Although some took on the Fuchsin stain, it was very doubtful if they were elastic fibrils, while the Weigert sections did not throw much light on this point. There were no changes suggesting commencing calcification. The islets were surrounded by a definite perichondrial membrane. The whole appearance presented by the sections suggested that the islets consisted of a definite embryonal type of cartilage.

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The connective tissue surrounding the cartilage islets presented the ordinary appearance of vascular adipose tissue, and no signs of any inflammatory change were present. There were no inflammatory cells, and perivascular infiltration was absent (Fig. 6). The lymphoid tissue was quite separate from the cartilage. It showed the characters of normal adenoid tissue with definite germ centres, and in all respects it was similar to the lymphoid follicles found in a normal tonsil. At several points the lymphoid cells invaded the epithelial covering and apparently passed out into the pharynx, as occurs in normal conditions. The epithelial covering, consisting of typical stratified squamous cells, differed in no respect from that covering the tonsil and the neighbouring parts of the pharynx. There was no evidence of any crypt formation (Fig. 4).

We are inclined to the view that, in this case, either cartilage cells from the second branchial arch or primitive chondrogenetic mesenchyme cells have become included during foetal life in the fibro-adipose tissue situated towards the lower part of the base of the tonsil. The growth of the cartilage cells or the development of the primitive chondrogenetic cells produced a prominence towards the lower tonsillar pole. This became elongated by the act of swallowing and the passage of food aided by the action of the pharyngeal constrictors. The process would be analogous to the formation of polypoid adenomata of the bowel or uterine polypi. Beneath the covering of epithelium which had been carried down in the process of elongation, lymphoid cells became deposited in the normal way. There is no evidence to lead us to believe that the condition was a metaplasia. The affection was unilateral, but this fact may be explained on the ground that no inclusion cells had become incorporated in the tonsillar tissue on the right side. The case, apart from the peculiar character of the appendage, seems to correspond in every way to the cases which have been recorded by Mantchik, Rückert, and others, who support the embryonic inclusion theory of origin of the cartilage areas.

**Incidence of Cartilage in the Tonsils.**—Islets of cartilage, or even bone formation, may be present in the tonsils. For the most part it has been considered a comparatively rare occurrence, but the recent interesting paper by Mantchik tends

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to throw doubt on this belief. He has analysed the findings in 100 consecutive cases examined *post-mortem*, with the result that histological evidence of the presence of cartilage was obtained in 38 instances. Other writers, basing their investigation upon a smaller series of examinations, have produced statistics varying from 1.5 per cent. to 35 per cent. From our own observations, and from those of our colleagues, we have not met with many examples, due, probably, to the want of a searching serial examination.

The age incidence seems to be highest from forty to fifty years, and it does not depend upon any associated specially morbid state. When a high percentage occurs coincidentally with any particular disease, the incidence seems to be due to the prevalence of the latter.

**Embryology.**—In order to understand thoroughly the theories which have been put forward in explanation of the condition, it is necessary to recall the manner in which the tonsil is developed. In foetal life the earliest evidence of tonsillar structure appears in the second pharyngeal pouch in close relationship to the cartilages of the second and third branchial arches. Grünwald states that outgrowths of the second arch may project into the “anlage” of the tonsil which, at this period, is formed entirely of connective tissue. This is a most important point to remember. There are also authentic cases on record where the styloid process or the lesser cornu of the hyoid bone have been found projecting into the tonsil and causing difficulty in its removal. Both these structures, along with the stylo-hyoid ligament, are derived from the second branchial arch.

There can be no doubt as to the possibility, at least, of cartilaginous rests forming in the connective tissue of the tonsil during development. Although the connective tissue framework forms about the 3rd or 4th months of foetal life, lymphoid tissue does not develop until just before birth and during the first year of life. One other point is worthy of mention: the cartilage itself is developed from primitive elastochondrogenetic mesenchyme cells. Although this is practically completed in the branchial arch before the tonsil forms, there may be numerous cells of this nature which have been retarded in their evolution, and which may, at a later date, commence to form cartilage cells of embryonic type. Retardation of

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development can be well seen in such a condition as congenital syphilis, where, even after birth, the liver is still filled with hæmogenetic cells, which should by this time have disappeared.

**The Histology of Recorded Cases.**—In all of these, so far as we can find, the cartilage occurs in the connective tissue, the fibro-adipose tissue at the base of the tonsil. It is never present in the lymphoid tissue, though it may project into it, as in Walsham's case. The islets are very irregular and variable in shape and size. They may be microscopic indeed, or perfectly obvious to the naked eye: they may even be palpable through the capsule. As many as twenty-six or more nodules have been described in one tonsil.

Histologically, they resemble embryonic tissue or that seen in the epiglottis. The cartilage cells are very numerous and large: the matrix is not abundant, and numerous elastic fibres pass through it. These fibres are said to be constant. According to Rückert and Mantchik, a definite perichondrium is present. In some cases, ossification has occurred: as a rule, this takes place in adults at a time when the same process may be going on elsewhere in the body.

The epithelium covering the tonsil is usually of the normal stratified squamous type, unless some accidentally associated disease is present, as in Lund's case, where there was hyperkeratosis.

**Pathology.**—Perusal of the literature demonstrates the fact that there are two main opinions regarding the pathogenesis of the condition—(a) the opinion which supports the embryonic inclusion theory, *i.e.*, the inclusion of cartilage cells from the second branchial arch within the area of the tonsil; (b) the opinion which regards the cartilage as derived from connective tissue cells of the tonsil as the result of inflammatory metaplasia.

The first is upheld by Orth, Deichert, Rückert, Reitmann, Mantchik, and others. The following points are put forward in support of it:—

- 1 The embryological relationship of the parts described above.

- 2 The nature of the islets of cartilage and their resemblance to the cartilage of the epiglottis, Eustachian tube, external

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ear, and the cartilages of Santorini in the larynx. These originate from the branchial arch, and elastic fibres are constantly present in them.

3. The islets resemble certain subcutaneous tumours which are found in the neck, and which are derived from the branchial arches.

4. The islets occur without inflammatory changes. Most authors have only examined tonsils which were diseased, neglecting healthy specimens, as Mantchik has pointed out.

5. Rückert found cartilage in seventeen out of forty new-born infants, and Lubrasch and Reitmann found it in embryos and foetuses where the tonsils could not have suffered from inflammation.

6. Although the cartilage may have been found more frequently in adults, tumour growth arising from embryonic cells is often seen only in adult life, as the rests may lie latent for long periods.

7. Rückert found perichondrium in the seventeen cases of cartilage met with in the tonsils of the new-born.

On the other hand, Topfer, Lund, Pollak, Noesske, and others support the view that the cartilage arises from a connective tissue metaplasia. The views which they put forward, and which can be easily encountered, are based practically upon the examination of diseased tonsils. They give the following reasons for their attitude:—

1. The frequency with which coincident inflammatory change is met with.

2. The greater frequency of the cartilage in adults.

3. The islets are too numerous to admit of their being derived from cell rests.

4. They are always confined to connective tissue, and are never found in the lymphoid tissue.

5. The cartilage never exhibits a perichondrium.

6. The transition from connective tissue to cartilage can be traced.

Lubarsch does not commit himself to either view, and he believes that probably both explanations are necessary in order to meet all the recorded cases. We shall refer in our conclusions to the value that may be attached to the evidence just cited in favour of the inflammatory factor.



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**Conclusions.**—The conclusions which we have drawn both from the study of this case and from the literature at our disposal, are as follows:—

1. The embryological theory of the development of cartilage nodules in the tonsils is very convincing. The mere fact that cartilage has been found in the tonsils of still-born children and fœtuses is very strong evidence in favour of such an origin.

2. The presence of the cartilage in the connective tissue, *i.e.*, the “anlage” of the future tonsil, and not in the lymphoid tissue, furnishes additional proof of its embryological origin.

3. The recorded cases which appear to be definitely due to metaplasia are, in all probability, if viewed in the light of cartilage development, cases in which the actual cartilage cells of the branchial arch have not been included, the inclusion being, on the other hand, the more embryonic chondrogenetic mesenchyme cells. Just as epithelial and germ cells are believed to lie latent until they are stimulated to renewed growth as the result of inflammation or of some other cause of irritation, so also it is not unreasonable to assume that the chondrogenetic cells may be stimulated in the same manner to form cartilage.

4. If we accept this view, it is easy to understand how the chondrogenetic cells may become separated by the strands of growing connective tissue, so that the nodules of cartilage will become multiple. It must be borne in mind, however, that only the primitive chondrogenetic cells will be available for the production of cartilage, and not all or any of the stroma cells as Noesske and others have stated.

5. Finally, the embryological view will explain two further points advanced in favour of the theory of metaplasia. (*a*) The more frequent occurrence of cartilage in adults is quite in keeping with the theory of cell inclusion as manifested in tumour growth. (*b*) An apparent transition from the connective tissue to the cartilage cells finds a natural explanation in the fact that the chondrogenetic cells are merely specialised connective tissue cells.

There can be no doubt, from a study of all these facts, that the theory of embryonic origin will explain all the cases in a satisfactory manner, so that the theory of metaplasia may be discarded.

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## DESCRIPTION OF PLATES.

- FIG. 1.—The enucleated tonsil covered with its capsule and showing the appendage.  
FIG. 2.—Naked eye section of the tonsil and appendage, the latter showing cartilage nodules.  
FIG. 3.—Low-power drawing of appendage; the three areas therein outlined indicate the position in the appendage at which the high-power illustrations, 4, 5 and 6 were taken.  
FIG. 4.—Section of periphery of appendage showing lymphoid tissue and stratified squamous epithelium covering the surface.  
FIG. 5.—High-power view of cartilage islet showing irregular cartilage cells, the scanty matrix, and surrounding perichondrial membrane.  
FIG. 6.—The connective tissue core of vascular adipose tissue, showing no evidence of inflammatory change.

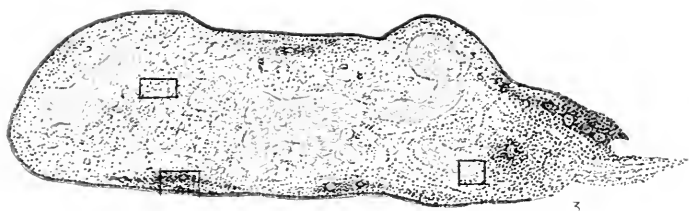
AN UNCOMMON TONSILLAR APPENDAGE AND ITS RELATIONSHIP TO CARTILAGE  
FORMATION IN THE TONSIL.—A. LOGAN TURNER and THOMAS SPRENT.



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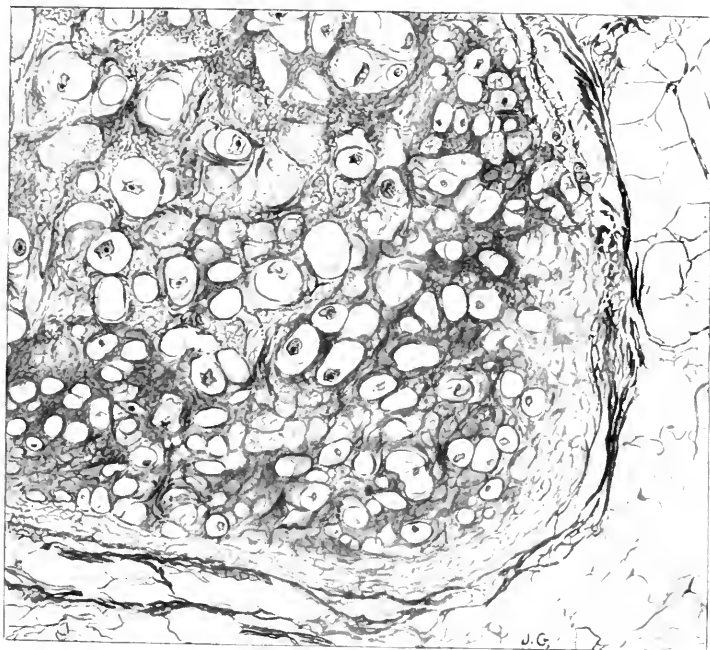


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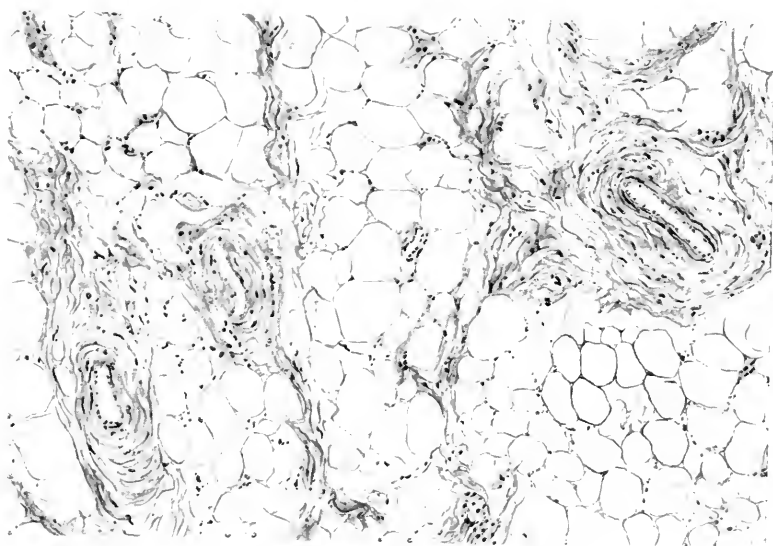


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## OCULO-VESTIBULAR CO-ORDINATION AS A BIOLOGICAL SURVIVAL-FACTOR.\*

By J. D. LITHGOW, F.R.C.S.E., Surgeon, Ear and Throat  
Department, Royal Infirmary, Edinburgh.

IF we work upwards from the point where there is the first appearance of a more or less definite oculo-motor apparatus, we find associated with it some form or other of static labyrinth which evolves with it, *pari passu*, in increasing anatomical complexity and accuracy of function until we arrive at the higher vertebrates. While for many purposes the ocular movements are controlled indirectly by the cortical centres, the method of control, being of more recent growth and more complicated in action, would not have been evolved except upon a basis of a more rapidly acting reflex mechanism. If a type is to predominantly survive, it must react suitably and rapidly to its environment. It is obvious how important it is that once the attention and the eyes are fixed upon any object—be it enemy or prey—that the advantage should not be lost by any sudden untoward change of position of the observer.

Now this result can only be sufficiently rapidly brought about by a mechanism, whereby the sudden change of position itself supplies the necessary stimulus directly to the oculo-motor centres, to compensate for the changed orientation of the subject. The static labyrinth supplies such a mechanism. The mechanism is so “geared” up with the oculo-motor apparatus, that a sudden change of mass or angular acceleration in one direction causes a corresponding movement of the visual angle in the opposite sense.

To take a few concrete illustrations of this:—A small bird in flying to escape from a hawk makes a sudden dive or change of speed; it would immediately be disoriented in respect of its enemy, if the movement of the eyes generated by the sudden change of acceleration did not thereby compensate for it. In close combat, of any sort, rapid changes of position are essential, yet the eyes must always remain fixed upon the opponent. It is important to note that where the eyes and body are both suddenly co-ordinated towards an

\* Paper read at the Meeting of the Scottish Society of Otology and Laryngology, Glasgow, 9th December 1922.

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object, the untoward movement of the eyes caused by the stimulation of the labyrinth is over-compensated by the voluntary ocular movement.

A simple subjective experiment will demonstrate this latter point:—Take two objects, one directly in the centre of the field of vision, and one, say, 45 degrees to the side. First note the slight, if any, muscular effort required in turning the eyes from the central to the laterally placed object. Next, close the eyes and suddenly turn the head towards the latter, and you will immediately experience a sense of muscular tension of the muscles to the opposite side. Finally, open the eyes and suddenly turn the head and eyes to the outer object, and you will experience an increase of this muscular sensation.

Under normal stimulation of the labyrinth from a momentary and not excessive change in acceleration, the object of attention still maintains the centre of the field of vision, but, where an excessive stimulation takes place, the centre of the field is drawn past the object in spite of the repeated voluntary attempt of the eyes to centralise it. This gives rise to a so-called nystagmus—that is an alternate slow and rapid movement of the eyes in respectively opposite directions. The slow component is due to the over-stimulation of the labyrinth and the rapid one to the voluntary attempt to counteract it. This is not a true *ocular* nystagmus where, according to Coppez and Axenfeld, rhythmic and equal movements of the same speed take place in opposite directions.

We may now briefly analyse the mechanism of this oculo-vestibular co-ordination by taking, as an example, a simple angular acceleration clockwise in the horizontal plane with the head slightly inclined forward at an angle of 30 degrees. The external or horizontal semi-circular canal of the side with the ampulla “leading” in the movement will be slightly stimulated by a negative pressure or efferent movement of the contained endolymph. The opposite condition will prevail in the “following” ampulla of the opposite side, with the result that the bilaterally co-ordinated centres will receive two impressions—one from each ampulla—a strong one from the “following” ampulla, and one rather weaker from the “leading” ampulla reinforcing it in the same direction. So that impulses go to the ocular muscles causing the eyes to diverge laterally in the same plane and direction as the moving endolymph of the canal. In other words, both the eyes and the endolymph will,



## Oculo-Vestibular Co-ordination

in virtue of the inertia of the latter, tend to remain at rest when the canal begins to move and the eyes are at length reluctantly dragged back with it. On a sudden stopping of acceleration the "leading" ampulla will be strongly stimulated by the on-rushing pressure of the endolymph, while the "following" ampulla is slightly stimulated by the receding and lessening pressure of the endolymph in the same direction. So that when the horizontal canal has come to rest the fluid endolymph tends to move on as before in the same direction, dragging so to speak the eyes with it. The semi-circular canal of the higher vertebrates, together with the utricle and saccule representing the static labyrinth of the lower types, are evolved to react to all changes of orientation by sensible mass or angular acceleration.

It will now be seen that types which have reacted to their environment by the production of a vestibulo-ocular co-ordination have survived thereby, and that absence of such a mechanism would have so handicapped any individual or competing species in the survival of the fittest that it would soon have ceased to exist. While the oculo-vestibular apparatus can only usefully function in the light, once an object is fixed by the vision, a momentary shutting off of light does not interfere with its accuracy of action, as its further mechanism is entirely automatic and independent of light. Any sudden acceleration of the body causes a corresponding movement of the ocular muscles even when no special act of vision has taken place. The vestibule also gives a similar response to local, mechanical, thermal, or electrical stimuli; the reactability to these stimuli, while incidental to the usual acceleration stimuli, may also be of independent biological value.

Under conditions where the oculo-vestibular reflex cannot be used for the purpose of orientation, this function may be carried out by similar mechanisms in which the skeletal muscles take the place of the eyes. Thus, an object located by the hand in the dark may be again instantly found after a sudden deviation of the body; the untoward deviation of the hand caused by this change of body position is compensated for by a corresponding movement of the arm in the direction of the lagging vestibular endolymph. A direct artificial stimulation of the vestibule without any body movement would of necessity cause a faulty displacement of the hand, owing to the fact that the associate mechanism existing between the

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cerebellum and the skeletal muscles for the repetition of given muscular sensations, is thereby interfered with as though by a bodily acceleration. The clinician is thus able to localise by a process of exclusion a fault in either the vestibule or the cerebellum, as they at times exercise a double and independent control over muscular sensation and movement.

In the case of a bird flying in mid-air, any sudden accidental displacement of equilibration or orientation will receive the appropriate direction through the conjoint mechanisms of the oculo-vestibular reflexes and the vestibulo-cerebello-muscular reflexes of the wings. The latter mechanism will also be of value in aquatic life and suggests nature's equivalent for the gyroscope. The nervous connections between the vestibule and certain viscera (*e.g.*, the stomach) may be a function now largely vestigial, but of vital importance in some of the invertebrate types lower down in the evolutionary ladder.

It will thus be seen that this form of vestibular nystagmus is not in itself a pathological condition, but an overflowing from a very vital mechanism, working under conditions of stress, and is, within physiological limits, the normal function of the oculo-vestibular apparatus and of immense value as a biological survival-factor.

# CLINICAL RECORDS

## MESOTHELIAL GROWTH OF THE LEFT VOCAL CORD.

By B. SEYMOUR JONES, F.R.C.S., Honorary Surgeon,  
Ear and Throat Hospital, Birmingham.

SMALL sessile tumours of the vocal cords always present some difficulty of assured diagnosis.

Their nature and pathological entity are not definitely known until we possess a microscopical report by a very competent expert. In very obscure cases the opinion of a pathologist who has had special opportunities of study is still more valuable.

In this connection the writer is of the opinion that every Ear and Throat Hospital should have a pathologist attached, to whom all specimens may be referred for microscopy so as to enlarge his experience and enhance the value of his opinion.

The following case is reported to orientate further the clinical and naked eye diagnosis of a rare tumour of the vocal cord, viz., an endothelioma or mesothelioma which may simulate an epithelioma :—

On 31st January 1919, a male, aged 68, timekeeper in a warehouse, was reported to the writer by his employers for huskiness of the voice, first noticed four months previously. He was a heavy pipe smoker, having little else to do.

Indirect laryngoscopy revealed a small sessile growth on the left cord situated about the middle, and a much smaller projection was seen further forward which was deemed to be part of the same growth. The tumour was yellowish brown in colour and looked exactly like dark sugar candy attached to the cord. It was somewhat mammillated on the surface and no sign of ulceration was seen. The affected vocal cord looked broader and more vascular than its fellow, thus showing some evidence of infiltration, but there was no limitation of movement at the crico-arytenoid joint.

Before interfering with it the writer fortunately made a water-colour drawing which is reproduced in black and white. (Plate.)

A local pathologist, to whom the small piece removed for microscopy was sent, pronounced it an unusual type of tumour and stated that

# Clinical Records

he would like another opinion. The slide was then referred to Mr Wyatt Wyngrave, who reported as follows:—

“The specimen sent to me for examination is a mesothelioma growing in cylindrical masses, some of which exhibit the hollow vessel centrally placed. In a more advanced area alveolation occurs. Nuclear multiplication is amitotic, only one true mitosis could be found. The surface epithelium is apparently passive.

“It is undoubtedly malignant but unlike the epiblastic growths, rarely affects the glands so that its malignancy is local and favours thorough removal. I have seen a great many examples of this group of growths in the larynx and pharynx. Doubtless they used to be classed with the epitheliomata which were surgically successful. I think we can safely exclude that variety (epithelioma) and call it a perithelioma of mesothelial genus.”

On reception of his report, in view of the probability of local recurrence, an operation was undertaken and the whole vocal cord removed by the window resection method, according to the Lambert Lack technic, without preliminary tracheotomy.

The patient made an uneventful recovery and can now—three years later—speak very fairly. There is no suggestion of any recurrence.

## DESCRIPTION OF PLATE.

FIG. 1.—Tumour on left vocal cord.

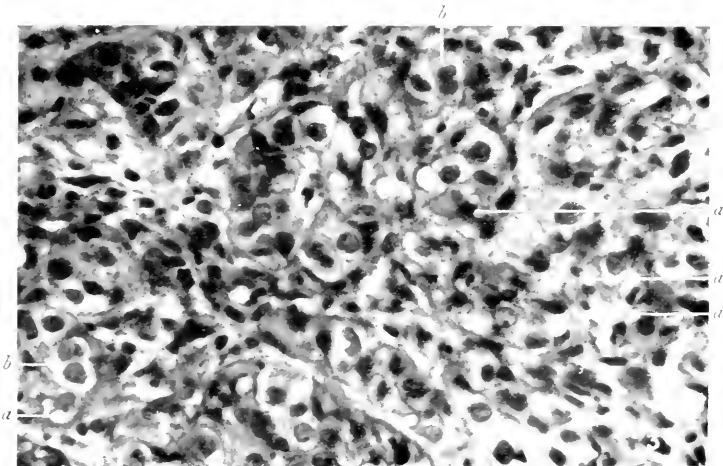
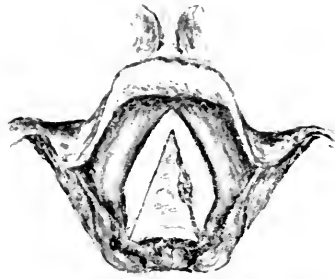
FIG. 2.—*Low Power* 1 inch object + 5 ocular. Transverse section of portion of tumour showing subepithelial growth pushing to surface through attenuated layer of epithelium which is ulcerating. (a) ulcerating area; (b) cord of growth, shown under high magnification in lower picture.

FIG. 3.—*High Power* Leitz  $\frac{1}{4}$  oil emulsion. Section of infiltrating cord of perithelioma showing vacuolation of protoplasm and amitotic division of cells characteristic of malignancy. (a) exhibits vacuolation of protoplasm; (b) amitotic division of cells, *i.e.*, simple fission of cells without transformation of nucleus into karyokinetic figures before division.

## THREE CASES OF ZYGOMATIC MASTOIDITIS.

By NICOL RANKIN, M.B., Senior Assistant Surgeon, Central London Throat, Nose, and Ear Hospital.

DURING the last two years two cases of zygomatic mastoiditis have come under my care, the last one on the 11th of November 1922. Both showed extensive loss of bone from disease with exposure of dura mater. In this respect they differed from





## Three Cases of Zygomatic Mastoiditis

the cases reported on by Mr Mollison in the *Journal of Laryngology*, November 1922, and I thought it might be of interest to record them now. Through the kindness of Dr Abercrombie I have been able to add the notes of a third case recently under his care.

CASE I.—A. B., female, aged 32, was admitted to the Central London Throat and Ear Hospital on the 9th April 1920, complaining of swelling and tenderness over the left side of the face and head of ten days' duration. For six weeks she had been deaf in the left ear, and there had also been discharge from it; the condition had arisen without pain or illness of any kind.

On examination of the left ear the external auditory canal was found much narrowed and full of thick yellow pus. The tympanic membrane was reddened and showed an antero-inferior perforation. Over the left mastoid there was marked swelling which extended above the ear and forwards over the temporal region as far as the eye and forehead.

At operation a free flow of pus came from the upper part of the mastoid incision. A large sinus was found at the root of the zygoma and immediately above it in the squamous temporal, through which the dura mater was seen covered with unhealthy dark granulations. An area of necrotic tissue was found on the under surface of the superimposed temporal muscle.

The mastoid cells and antrum contained pus. There was necrosis of the tegmen antri where the dura was also exposed and covered with granulations. Only a cortical mastoid operation was done; this was very extensive as all the cells down to the tip of the mastoid were infected. No direct connection was discovered between the disease in the mastoid antrum and cells and the necrosis in the temporal region. The mastoid antrum and cavity were drained through the lower part of the incision, and the temporal region through the upper part. B.I.P.P. packing was used in both positions. The temperature on admission was 98.4 F.; it rose to 99.2 after the operation where it remained for twenty-four hours, thereafter it fell to normal. Spoken voice was only heard close to the left ear before operation. Tested some months afterwards the hearing had returned almost to normal.

CASE II.—C. D., a female, aged 6 years, was admitted to the hospital on 11th November 1922, complaining of a painful tender swelling behind, above, and in front of the left ear. The child had had attacks of earache off and on for a year. These had become more frequent and more severe since an attack of measles in the spring of this year. Three weeks before admission the earache recommenced, and for four to five days was very intense. The ear

## Nicol Rankin

then discharged. Treatment was carried on at home. The ear was syringed three days before admission ; this was followed by swelling of the temporal region which increased noticeably on the two following days.

On examination there was marked œdema, with pitting, over the left temporal region. The left upper eyelid was slightly puffy. The swelling extended backwards above the left ear and down to the mastoid process. There was tenderness over the swollen area. Much thick pus came from the external auditory meatus. The tympanic membrane was not seen. The hearing was only slightly diminished. Temperature was between 101-103°.

At operation pus at once welled up from the top of the mastoid incision. Although the posterior root of the zygoma and the bone immediately above it were stripped of periosteum, and the surface was rough and eroded looking, the point of exit of the pus was not at first discovered.

A cortical mastoid operation was performed. The antrum and all the cells were found full of pale granulations ; little actual pus was present. Large cells which extended forwards were found in the outer attic wall and a track of softened bone led into a cavity in the posterior root of the zygoma. The cavity was discovered by going over the surface of the zygoma carefully with a Grant's probe, when a little extra pressure over a suspiciously roughened area forced the point of the probe through, and another free flow of pus followed. All dead bone was carefully removed. Exposed dura mater covered with dark, soft granulations was seen in the depth of the cavity.

The cells in the outer attic wall were large and infected. The bone in front of the most anterior cell was certainly soft and easily scraped away so that there was a large and continuous cavity at the end of the operation, but I would not say for certain that the spread of the disease had been direct by bone from antrum to the zygoma.

The cavity was packed with B.I.P.P., and up to the present the child has made good progress.

The above cases came to Dr Abercrombie's clinic when I was acting for him, and he has kindly given me permission to make these notes about them.

CASE III.—D. P., female, aged 9, was seen by Dr Abercrombie on 21/12/22 complaining of swelling of the left temporal fossa and side of the face, and œdema of the left eyelids and earache on the left side. Two months ago she had "gastric" influenza. She had been up and apparently quite well for four days and had then gone out. She complained, four weeks ago, of earache in the left ear. This had continued, accompanied by some mastoid tenderness, but the



## Three Cases of Zygomatic Mastoiditis

ear had never discharged. The temporal swelling appeared a week ago and she had some epistaxis. The œdema of the left eyelids had been present for twenty-four hours.

When seen by Dr Abercrombie there was marked swelling over the left temporal fossa with pitting on pressure. This extended backwards and downwards on to the mastoid process where, however, it was much less marked. There was œdema of both eyelids. Tenderness was such that the child could hardly bear examination. The left tympanic membrane was bulging. No perforation was seen. The patient was at once sent to hospital, where a cortical mastoid operation was done. Pus came down from under the upper end of the incision. A sinus the size of a large pea was found on the surface of the posterior root of the zygoma. This was full of granulations, and the under surface of the overlying temporal muscle was necrotic. The mastoid cells were diseased down to the tip, the whole process being full of pus. No channel was discovered leading directly from the diseased mastoid cells forwards to the diseased portion of the zygoma, but a gutter was easily made through obviously softened bone connecting the two cavities together. Good drainage of the zygomatic cavity was thus secured. The outer attic wall was left intact. The dura mater was not exposed in the region of the zygoma, but it was so over the tegmen antri. The whole cavity was packed with B.I.P.P.

## SOCIETIES' PROCEEDINGS

### ROYAL SOCIETY OF MEDICINE—SECTION OF LARYNGOLOGY.

December 1, 1922.

*President*—Mr CHARLES A. PARKER, F.R.C.S. Ed.

**Case of Shrapnel Wound of Larynx**—JAMES ATKINSON, M.B.—Male, wounded 1918 by shrapnel which entered the neck on the left side, passing out on the right; both wounds were close to level of upper border of the thyroid cartilage. He suffers from hoarseness varying in degree. Opinions were desired regarding the laryngeal appearances.

Mr CHARLES A. PARKER (President) said there was some paresis of the inter-arytenoid muscle, and the tips of the vocal processes were very prominent. If there had not been the history of the shrapnel injury, he would have regarded the condition as chronic laryngitis, with some paresis of the cords.

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Mr NORMAN PATTERSON said he considered the larynx proper was practically normal, except for some swelling of the anterior portions of the ventricular bands. But there were swellings above the larynx—that on the left side being more marked—and they probably represented the greater cornua of the hyoid bone. He thought a skiagram, showing both antero-posterior and lateral views, would be useful in interpreting this most interesting laryngeal picture.

Mr MARK HOVELL said that the swellings were probably present before the accident.

Dr JOBSON HORNE remarked that the appearance was unlike anything he had seen, and he did not feel sure that the condition was caused by shrapnel.

Sir ST CLAIR THOMSON remarked that if there had not been the history of the injury, he would not have considered that there was much the matter with the larynx, except that the patient had ventricular band speech, and the internal tensors of his cords were defective. He advised re-education of the voice. The missile, he thought, had gone through the ventricular bands.

Dr ATKINSON (in reply) said that the larynx showed an ordinary picture of slight chronic laryngitis; but this was merely incidental. The predominating interest in the case was the displacement of the cornua of the hyoid bone—seen just above the arytenoids—due to contraction of the thyro-hyoid membrane, or fracture of the greater cornua of the hyoid bone resulting from the wound. There was no evidence at all of any injury to the ventricular bands.

**An Unusual Tonsillar Appendage and its Relation to Cartilage Formation in the Tonsil**—A. LOGAN TURNER, M.D., and THOMAS SPRUNT, M.B. (*Journal of Laryngology and Otology*, April 1923, p. 179).

### DISCUSSION.

Dr WILLIAM HILL said it had been stated that cartilage cells were normal in the fibrous framework of the faucial tonsils, especially in the young. Therefore there was no need to invoke any special embryonic departure from the normal to account for the presence of the cartilage itself. Abnormal developments of these cartilaginous areas were rare.

Dr IRWIN MOORE said that this contribution was of great interest to him, as he was shortly publishing a paper on the subject. He thought the pedunculated cartilaginous tumour now shown was unique. He confirmed the opinion that cartilage cells were always found in the connective tissue structure of the tonsil, and never in the lymphoid tissue, and that these cartilaginous islands were surrounded by perichondrium. Again, the cartilage was always of the embryonic type. Orth (Göttingen) first observed cartilage in this situation in 1893, and Walsham and Wingrave in 1898. The latter concluded that it was present in only  $\frac{1}{6}$  to  $1\frac{1}{2}$  per cent. of cases. The recent research work of Mantchik, of Geneva, has shown

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that cartilage was present in 38 per cent. of the cases he examined. He (Dr Irwin Moore) exhibited by means of the epidiascope, microscopic sections, recently prepared by Professor S. G. Shattock, showing cartilaginous islands in the capsule of a specimen of lympho-sarcoma of the tonsil removed by Mr Howarth, also similar islands in the connective tissue capsule surrounding the ivory exostosis recently recorded by Mr Tilley.

Mr J. F. O'MALLEY remarked that the process in which Dr Logan Turner found the cartilage was on the free surface of the tonsil—that which projected into the pharyngeal space. One would expect cartilaginous inclusions on the capsular aspect, if one reflected upon the development of the tonsil and its relationship with the branchial arches. That part of the second arch designated the epi-hyal was the portion brought into contact with the second cleft, from which the tonsil developed. The case seemed to be one in which cartilage was displaced far beyond the point at which one would expect to find it, and it was therefore of exceptional interest and rarity.

Dr LOGAN TURNER (in reply) said this was the only specimen of the kind he had seen, and apparently none of the members had previously seen a similar one. The embryonal inclusion theory was the most satisfactory explanation of the occurrence of cartilage in the tonsil.

**Case of Myasthenia Gravis in which Throat Symptoms were an Early Sign**<sup>1</sup>—C. P. SYMONDS, M.D. (introduced by Mr T. B. Layton).—Female, a school teacher, aged 44, first complained at the age of 21, of ptosis, when tired. In April 1919 her voice became nasal, just as if she “had a cleft palate,” and she was unable to clear her throat properly. Subsequently dysarthria, difficulty in chewing and in swallowing, developed. These symptoms cleared up from time to time. Later she had double vision, and at times lost power in the upper and lower limbs. She has been teaching without intermission from September 1919 up till September 1922, though often under considerable difficulty. At present the incapacity for sustained effort is most marked in . . . upper eyelids.

In the early stages the patient was twice referred to a laryngologist for an opinion. The characteristic features of myasthenia gravis were present, as there were marked remissions of the symptoms, and these only occurred on fatigue.

From the point of view of the neurologist it is interesting that the patient's condition should have been repeatedly diagnosed as hysteria. It is time that hysteria ceased to be a dumping-ground for unsolved diagnostic problems, especially since—by a proper mental examination—positive evidence of the disease, when present, can be discovered.

<sup>1</sup> For a full report of this case, vide *Guy's Hospital Gazette*, 28th October 1922, p. 445.

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Mr E. D. D. DAVIS said that these patients usually came to the laryngologist on account of a defect of speech. In his cases, fairly advanced, the patients had a marked nasal voice typical of a paralysis of the soft palate, with regurgitation of fluids through the nose. On examination, the paralysis became more and more marked as the patient became fatigued. The larynx showed a definite adductor chink as seen in functional aphonia, and, on inducing fatigue, the cords became immobile and resembled abductor paralysis, and difficulty in swallowing was experienced. The variable paralysis along with the expression of the face was characteristic, and, if accompanied by ocular paralysis, the diagnosis was complete. Some patients suffered from attacks of dyspnœa, and Mr Somerville Hastings had shown a case in which death occurred suddenly from that cause. Patients were said to improve greatly during pregnancy, and on the assumption that the disease was due to a disturbance of the internal secretion, polyglandin had been prescribed. He asked whether Dr Symonds had tried polyglandin, and with what result.

Mr ARCHER RYLAND pointed out that there was a marked reduction of sensibility of the soft palate in this case. When this sign was present, he was always suspicious of a possible "hysterical" condition. He asked Dr Symonds whether, in his opinion, this phenomenon—as an indication of "hysteria"—had been overrated.

Mr SYDNEY SCOTT said he had seen several of these cases through his association with the National Hospital at Queen Square, but when he saw them the diagnosis had been already made, and it became a matter only of laryngeal examination. He had noticed the ptosis, the weak muscular movements of the palate and tongue, as well as the laxity of the vocal cords. He suggested that possibly the apparently reduced sensitiveness of the palate, present in these cases, was comparable to the apparently sluggish corneal reflex in cases of facial paresis; and he asked if Dr Symonds agreed that this was so.

Dr C. P. SYMONDS (in reply) said the prognosis of the condition was less serious than was generally supposed. The danger lay in the fatigue involving the respiratory muscles and so causing death from respiratory failure. In some cases artificial respiration had been kept up for many hours, and the patients lived for a year afterwards. Spontaneous remissions were characteristic of the disease. One of his cases died six months after the onset of the disease. The patient shown seemed to have had some symptoms for eighteen years, based on the ptosis. It was difficult to make a prognosis in any given case. These patients had marked freedom from the symptoms during pregnancy. One patient in hospital was transfused with blood from a pregnant woman, but without benefit. He was now trying large doses of corpus luteum, and the patient seemed better. The creatin findings fitted in with the low muscular metabolism; further observations were required before it could be known that abnormal creatin output had anything to do with causation in this disease. He did not quite agree with Mr Scott's explanation of the apparent anæsthesia of the palate. Many of the patients complained of sensory symptoms; in one case the symptoms began with a loss of taste, and that was followed by

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anæsthesia in the tongue. The patient shown discovered the anæsthesia of the palate accidentally. He did not regard anæsthesia of the pharynx as a valuable sign in hysteria. The so-called stigmata of hysteria could be produced in most people by suggestion.

**Case of Myotonia Atrophica with Implication of Left Crico-arytenoid Muscle**—HERBERT TILLEY, F.R.C.S.—Male, aged 26, had for five years complained of increasing muscular weakness, aggravated by exertion. This was first noticed when, as a soldier, marching made his legs “flop about,” and he had great difficulty in rifle drill. He had had malaria, sand-fly fever, dysentery, influenza, and “dry pleurisy”; there was no history of syphilis.

He was a thin, under-developed man, of dull apathetic appearance; voice high-pitched and weak; speech is rather indistinct and words tend to run together. He gives the impression of being weak and stiff in his movements.

Lateral eye movements deficient; ptosis on each side; weakness of all the facial muscles due to wasting, most marked on left side. Sagging of lower jaw; slight difficulty in swallowing; sterno-mastoids very weak and wasted, especially on left side. Slight general wasting of both upper limbs, most marked in the inner flexors of forearms. Wasting and extreme weakness of vasti externi, peroneal and anterior tibial groups of muscles, and hence the tendency to inversion and dropping of feet. The reflexes of the upper limb are very sluggish, and are absent at the ankle-joint. Rombergism well marked. Larynx: In phonation the left vocal cord is motionless in the middle line.

**Case of Multiple Foci of Growth in the Palate and Tonsil**—W. M. MOLLISON, M.Ch.—Male, aged 64, noticed patches of ulceration on the palate about ten months ago; under potassium iodide, improvement, but some patches remain. About five or six months ago glands appeared on the right side of the neck, but have disappeared: for some weeks past a swelling at the angle of the jaw on the left side has been so painful as to keep the patient awake at night; it is also hard and tender. At the upper pole of the left tonsil is a hard nodule involving the anterior pillar. On the hard palate are three or four small raised patches, while on the most anterior part is a larger area of ulceration. Microscopical examination shows one of the patches to be carcinoma.

Mr CHARLES A. PARKER (President) asked from which growth a portion had been taken for examination. He thought the small growth on the palate might be inflammatory, due to an ill-fitting dental plate, and quite independent of the growth in the tonsil, which was evidently malignant.

Mr STUART-LOW said he had not previously seen a case of this kind in which multiple ulceration had occurred. The growths were hard and

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tender on palpation, and did not appear to be of an inflammatory nature, particularly on the right tonsil. He regarded the discrete deposits as breaking down gummata which had become malignant. This patient presented some of the conditions which in his (Mr Stuart-Low's) opinion led up to malignant disease of the throat, *e.g.*, excessive smoking, swallowing of very hot food, septic mouth, with marked acidity of the fluids in the mouth, taking a large quantity of salt with food, and syphilis.

Mr MOLLISON reported that the section of a second nodule removed did not show carcinomatous tissue.

**Congenital Webbing of the Larynx**—G. W. DAWSON, F.R.C.S.I.—Female, aged 21, complained of hoarseness for many years; no history of any laryngeal affection. A crescentic web with concavity looking backwards is seen in the anterior portion of the larynx, stretching between the vocal cords.

**Microscopic Section of a Benign, Pedunculated Tumour of the Left Tonsil**—HERBERT TILLEY, F.R.C.S.—A small ovoid tumour, attached by a thin pedicle to the upper pole of the left tonsil, removed from a young adult. It measured  $\frac{1}{2}$  in. in length and  $\frac{1}{4}$  in. in breadth. Microscopically it proved to consist of normal tonsil tissue.

**Case of Chronic Empyema of the Antrum; Canfield's Operation; Recovery**—Sir JAMES DUNDAS-GRANT, K.B.E., M.D.—Male, aged 32, complained of fœtid purulent discharge from the left side of the nose, of four years' duration, accompanied by left frontal headache. Transillumination showed opacity of the left antrum, and puncture gave vent to a quantity of fœtid pus. The middle turbinal was enlarged, and the anterior part of it was removed so as to free the infundibulum and the orifice of the antrum. This was followed by relief to the headache, but repeated punctures showed no diminution of the amount of pus. Canfield's operation was performed, and in a few days the purulent discharge had completely disappeared.

Sir JAMES DUNDAS-GRANT said he found that after Canfield's operation the cavities cleared up much quicker than by any other method. He had shown a number of these cases before the Section, and had described the operation in detail.

**Case for Diagnosis**—H. BELL TAWSE, F.R.C.S.—In a female, aged 40, slightly to the right of the middle line of the neck, lying over the upper part of the right ala of the thyroid cartilage and adjacent part of the thyro-hyoid membrane, there stretches up to the submental region a cystic swelling of the size of a pigeon's egg. It is painless, varies in size, and appeared in June of this year. On the anterior surface of the epiglottis on the right side and filling up the

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vallecula is a rounded, smooth, semi-translucent swelling with blood vessels coursing over it. It appears to elevate the ventricular band and to obscure the vocal cord. It greatly impedes the movements of the right side of the larynx. The patient's voice is somewhat impaired, but otherwise she is well.

Mr A. J. M. WRIGHT thought the swelling was a thyro-glossal cyst. In 1913 he showed a cyst he removed from a patient, and last week he operated on a similar case. These cysts were easily removed by dividing the body of the hyoid and removing the cyst without opening the mucous membrane.

Mr NORMAN PATTERSON said the condition had evidently somewhat altered since the description was written.

Mr H. BELL TAWSE (in reply) said he considered the swelling was a dermoid, and he agreed that there had been a recent alteration in the appearance since the notes of the case were submitted. A fortnight ago the cyst was four times its present size, and the right vocal cord could not be seen. He had never seen a case in which there was so much extension upwards and to one side. It might have originated as a hyoid bursa, which had become cystic and extended up beyond the thyro-hyoid membrane to the region of the vallecula.

**Thyroid Tumour from Base of Tongue**—H. BELL TAWSE. F.R.C.S.—Female, aged 52, had a growth removed from her throat over twenty years ago, said to be sarcoma; again, one year later, when it was said to be benign. Further operation on throat two years later—no history of result. There was no more trouble till last Christmas when she felt a "lump" in throat which gradually caused some difficulty in swallowing and, later on, some obstruction to breathing.

In July 1922, a brownish foul-smelling mass was seen protruding from the epiglottic region. Palpation by the finger showed it to be a soft, rounded tumour, bleeding freely on touch, and covered with stinking crusts. It seemed firmly adherent to the epiglottis, the tip of which was free from the growth: no dyspnoea except on exertion. A few anterior cervical glands were enlarged on both sides. Three pieces removed—free bleeding. Pathologist's report:—"Tissue entirely necrotic with the exception of one part which shows cavernous tissue." Wassermann test negative. Two larger pieces removed—bleeding so profuse as to cause anæmia. Pathologist's report:—"Hæmangioma of the capillary type—most of mass necrotic."

28th August 1922. Tracheotomy.—Subhyoid pharyngotomy gave insufficient room for removal of the growth, and a transhyoid incision was made and the divided growth appeared to be adherent to the epiglottis which was cut through and removed along with the mass which shelled out from the base of the tongue; no hæmorrhage. Extremities of incisions drawn together with deep placed silkworm-gut; centre left open and drained. The wound healed completely.

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Pathologist's report:—"Sections show structure of so-called foetal adenoma of thyroid. A few acini contain normal staining colloid. Periphery of growth shows dense vascular supply, and on the free surface it is entirely necrotic."

There was no thyroid gland palpable in the neck.

Mr W. M. MOLLISON said Mr Steward had recently reminded him of a case of thyroid tumour at the base of the tongue which he had removed. It was the only piece of that tissue present in the patient's body, and its removal followed by acute myxœdema had necessitated thyroid extract being constantly taken by the patient ever since.

**Nasal Stenosis, mainly Subjective, in a Case of Parkinson's Disease**—Sir JAMES DUNDAS-GRANT, K.B.E., M.D., and C. C. WORSTER-DROUGHT, M.D.—Male, aged 40, with the expressionless, "mask-like" face of paralysis agitans, but without shaking, was referred by Dr Worster-Drought, complaining of nasal obstruction. The turbinated bodies were somewhat hypertrophied, but not sufficiently so as to produce the amount of obstruction of which the patient was conscious. The sensibility of the nasal mucous membrane was found to be lowered to a very great degree, so that patient did not perceive the air passing through the nose, and consequently felt as if it did not do so—"subjective nasal stenosis."

Mr O'MALLEY said the patient had told him that he had difficulty in breathing when he lay down at night, or when he was in a warm place. This difficulty of breathing was accounted for by the hypertrophy of the turbinates present in the case, apart from any supposed loss of physiological function.

Dr JOBSON HORNE said it seemed to be an ordinary straightforward case of an enlarged middle turbinal, which required reducing.

Dr W. H. KELSON referring to the nomenclature of diseases, considered that the better known term "paralysis agitans" was preferable to "Parkinson's disease."

Sir JAMES DUNDAS-GRANT (in reply) said that at first he described the case as "paralysis agitans," but Dr Worster-Drought termed it "Parkinson's disease" (synonym). The case showed the physiognomy of this disease though the patient was rather younger than usual.

**Case of Chronic Laryngitis of Long Standing**—C. A. S. RIDOUT, M.S.—Male, aged 50, was seen in April 1921 complaining of hoarseness of four to five years' duration. He gave a history of syphilis many years ago. Wassermann test negative. By occupation he is an instructor in physical exercises, etc. On examination of the larynx the right vocal cord showed destruction in middle third by old, now healed, ulceration, with a rounded prominence anteriorly. The left vocal cord showed considerable destruction and irregularity, a protuberance in the middle third seeming to fit into the depression



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in the right cord. Ventricular bands thickened. Movements good. During the past eighteen months patient has had potassium iodide at intervals, inhalations of menthol, astringent sprays, and mercurial inunction into the thyroid alæ. A small portion of tissue removed with the forceps showed no malignancy. The condition has changed of late; the voice is still hoarse, movements of the vocal cords remain good, and the depression in the right vocal cord seems to have filled up. Both cords, however, are thickened and irregular, and the left shows a sessile raised whitish patch in its middle third with an oblique cleft separating it from a pinkish, swollen posterior third.

Treatment has recently been discontinued. The opinion of the Section was desired: (a) As to the nature of the condition, especially that of the left vocal cord; (b) as to future treatment; (c) as to prognosis.

MR CHARLES A. PARKER (President) said he had seen a similar condition in patients who had had syphilis and used the voice excessively, in one instance, in a butcher, who cried his meat outside his shop. He considered the condition was due to chronic laryngitis profoundly influenced by the fact that the patients had had syphilis, though the lesion itself was not syphilitic. In his cases treatment had been of little use, and he thought the prognosis as regarded the voice was unfavourable.

DR JOESON HORNE agreed with the President, and remarked that it was the kind of case which suggested epithelioma. The clinical history, the symmetry, and the absence of gland involvement, however, were against epithelioma. There was no ulceration in the larynx, merely thickening of the vocal cords and epithelium. He regarded it as a case of pachydermia syphilitica. He had seen, at autopsy, a larynx in such a case and had microscoped it; and it showed a considerable heaping up and thickening of squamous epithelium. There was a tendency for the condition to spread below the larynx, thereby placing the patient in difficulties. He did not think the condition would improve, except temporarily. He knew of one case in which tracheotomy became necessary. The less the patient used his voice the better, and he should take very little alcohol. The only drug that gave any hope was iodide of potassium. About eight years ago, Mr Tilley showed a woman with such a condition which was thought to be malignant. He had examined the larynx in that case and would exhibit the specimen at a later meeting. It illustrated dovetailing of the cords as the disease progressed.

MR TILLEY spoke of a similar case which he had recorded in the *Proceedings* in 1916, under the title of "Leucoplakia of the Vocal Cords," in which there were lenticular leucoplakic patches on the upper surface of the anterior third of each vocal cord. Antisyphilitic remedies proved futile, and the condition remained the same for about two years, when patient was lost sight of. In discussion, one member of the Section suggested that the lesions were early tubercular, but no other signs of tubercle were present. The patient referred to by Dr Horne insisted on leaving hospital, and two days later she suddenly expired. At autopsy a hobnailed liver was found, in addition to extensive interarytænoid

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hyperplasia referred to by Dr Horne. Possibly this was only local evidence of a general fibrosis of different organs.

Mr E. D. D. DAVIS said he had seen two cases of the same kind. The first was that of a salesman who talked, drank, and smoked too much. The ventricular bands were œdematous and obscured a view of the vocal cords. Iodide of potassium was prescribed in large doses, without any improvement. The second patient was an engine-driver on whom he (Mr Davis) had performed laryngo-fissure, as the condition was thought to be an epithelioma. It proved to be tubercular, and the sputum was found to contain tubercle bacilli. Patient was still alive and well.

Dr WILLIAM HILL said this case showed an unusual leucoplakic pachydermia, with an irregular surface, and indentation of the right cord. He thought the application of the galvano-cautery would reduce the tumefaction. (Dr Jobson Horne: The galvano-cautery would aggravate the pachydermia.)

Dr BROWN KELLY suggested that the condition on the left cord was epithelioma. The right cord presented healed ulceration which might have been syphilitic.

Mr RIDOUT (in reply) said he regarded it as a pre-cancerous condition. He had been in doubt whether he ought to watch the case or take immediate active measures. After hearing the discussion he had decided to watch the case, but he thought that it would soon be necessary to deal with it surgically.

**Case of Pendunculated Angeioma (Bleeding Polypus) of the Inferior Turbinal**—SOMERVILLE HASTINGS, M.S.—Female, aged 24, complains of slight nasal obstruction relieved by blowing out a piece of fibrinous exudate, and accompanied by hæmorrhage every evening, together with a feeling of fullness in the nose. She gives two months' history of these symptoms. A pedunculated growth will be seen growing from the upper part of the right inferior turbinal, about the size of a pea. It bleeds very easily when touched. The case would seem to resemble a similar one shown by the writer on 4th March 1910.

Dr W. H. KELSON said that this tumour was formerly described as bleeding polypus of the septum, on account of its supposed limitation to that locality. It had more recently been shown that such tumours sometimes originated from other parts of the nose, *e.g.*, the inferior turbinals. Sir St Clair Thomson, in the latest edition of his text-book on *Diseases of the Nose and Throat*, had described these tumours under the title of "bleeding polypus of the nose."

Mr SOMERVILLE HASTINGS (in reply) said he would remove the tumour and show the sections at a later meeting.

**Cyst of Uvula**—T. JEFFERSON FAULDER, F.R.C.S.—Patient, a child, aged 10 months. The uvula, except at the tip, was completely involved by a translucent cyst. Scanty fibres and minute vessels were

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spread over the surface. The mother stated that it had been present since birth. It had produced no symptoms, but was getting larger. Removed by cold snare.

## **Two Cases of Pulmonary Tuberculosis with Laryngeal Symptoms**—PHILIP FRANKLIN, F.R.C.S.

CASE I.—Male, aged 49, had suffered from pulmonary tuberculosis since 1918, and had undergone seven months' sanatorium treatment. Sputum and X-ray positive. Larynx shows swelling of the left aryæno-epiglottidean fold, with ulceration of the left aryænoïd cartilage; there was no pain. The case shows characteristics similar to the next, yet the larynx is undoubtedly tuberculous.

CASE II.—Male, aged 40, had an attack of hæmoptysis in February 1922, and since then he had been under treatment for pulmonary tuberculosis. Three weeks ago he developed a husky voice. X-ray confirms the physical signs of a cavity at the right apex; sputum contains tubercle bacilli: there is no pain. Larynx shows ulceration of the right aryænoïd. When first examined two weeks ago, the ulcerated area gave the impression that a growth was present. The Wassermann reaction is positive. After a week's treatment with potassium iodide, the larynx rapidly improved. This case is of special interest in view of the syphilitic nature of the larynx, associated with advanced pulmonary tuberculosis.

Mr CHARLES A. PARKER (President) said he thought one of the cases was typical tubercle of the larynx. If the other had been tuberculous, there was now fibrosis, and activity had ceased.

Mr FRANKLIN (in reply) said that he brought the cases forward because of points of similarity between them. The case referred to by the President as showing fibrosis had had a definite ulceration a few weeks ago, and a three weeks' history of hoarseness. When first seen it did not appear to be a typical case of tuberculosis. A Wassermann reaction proved to be positive. The condition was now clearing up under iodide of potassium. The other showed a similar condition of the larynx, yet was definitely tuberculous.

## THE SCOTTISH SOCIETY OF OTOTOLOGY AND LARYNGOLOGY

SIXTEENTH MEETING, WESTERN INFIRMARY, GLASGOW

December 9th, 1922.

*President*—Dr JAMES GALBRAITH CONNALL.

**Cases of Malignant Disease of the Pharynx treated by Surgical Diathermy**—W. S. SYME, M.D.—Four patients, all males, were shown, in whom epithelioma had involved tonsil, soft palate, and

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pharynx. In two of them the tongue and lower jaw were also implicated.

**Carcinoma of Right Tonsil and Soft Palate treated by Diathermy**—JAMES ADAM, M.D.—Female, aged 46, in 1921 had induration of right tonsil and posterior pillar. Wassermann strongly positive. Microscope revealed carcinoma. She refused treatment. A year later she returned with considerable extension of disease. After salvarsan injections the growth was removed by diathermy.

Dr LOGAN TURNER said that one had only to look at these cases to realise the value of the diathermy method. He would have liked some information as to the exact technique employed in the different cases—which of them were treated with the button electrode and which with the knife electrode? He suggested that the cases which surgeons considered operable with the knife should be treated instead by diathermy.

Dr HOWIE asked if there was any necessity for ligaturing arteries in any of these cases before they were submitted to operation.

Dr W. S. SYME said he employed the diathermy knife and any suspicious part that was left was touched with the button. Two of the cases he looked upon as surgically operable, and so far—it was only six months ago—they remained alive and free from sign of recurrence. Another case was sent as inoperable, and the man had had six months of comfort. The absence of surgical shock was very noticeable. On the next day the patients were able to sit up. He had not ligatured any vessels. In one case, seven days afterwards, there was some troublesome hæmorrhage from the separation of a slough.

Dr KERR LOVE asked if there was any objection to removing the glands now.

Dr W. S. SYME did not think there was if he could be quite sure that he had got rid of the initial disease. He thought he had operated upon ten or a dozen cases altogether.

Dr CAMPBELL MACGREGOR reported a fatal carotid hæmorrhage in a case operated upon by Dr Syme. It occurred on the second night after the operation. In advanced cases of disease, he thought preliminary ligation was necessary.

**Left Temporo-sphenoidal Abscess and Purulent Meningitis; Labyrinthectomy, Translabyrinthine drainage, Abscess drained, Recovery**—W. S. SYME, M.D.—Boy, aged 14, had long-standing left otorrhœa. Two days before admission he had become seriously ill, with giddiness, nausea, and severe pains in the head. He was very restless, crying out with pain in the head, and only partly rational. A polypus protruded from left ear; well-marked nystagmus towards the right. Temperature 101. Pulse 120. Immediate operation was performed. As the roof of the antrum and tympanum was found to be necrosed and the dura exposed and bulging, exploration of temporo-sphenoidal lobe revealed a large

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abscess. A rubber tube was introduced into the abscess cavity: labyrinthotomy and translabyrinthine drainage were carried out. Collosol argentum was poured into the mastoid cavity to mix with the cerebro-spinal fluid. The further history of the case was as follows. The cerebro-spinal fluid drained well for five days, and the brain abscess was drained for seventeen days. The cerebro-spinal fluid contained a large number of polymorphonuclear leucocytes; no organisms were found and culture yielded no growth. Patient discharged at end of six weeks.

## **Temporo-sphenoidal Abscess with crossed Paralysis—**

JAMES ADAM, M.D.—Girl, aged 8, with discharge from left ear for eight months following scarlet fever. Pain in the ear and left side of head; shivering. Mastoid operation and large perisinus abscess drained. Two days later, paralysis of left 3rd; paresis of right facial, weakened right hand grip, with ankle clonus and absence of abdominal reflex and no Babinski. Cerebration becoming dull. Large temporo-sphenoidal abscess drained. C. S. fluid under slight pressure. Recovery.

Dr JAMES HARPER said that all his cases of purulent meningitis had died, which he thought was the experience of most of us. He had looked for something new in Dr Syme's methods, but had found nothing. He thought there was nothing in the symptoms described to justify the diagnosis of purulent meningitis, and in the absence of micro-organisms in the cerebro-spinal fluid he did not think the diagnosis should be made. They were obviously cases of serous meningitis or meningeal inflammation, but certainly not of the purulent type, and to open a labyrinth and drain the cerebro-spinal fluid into an already infected cavity was a procedure which he did not think justifiable. Dr Syme must be aware that it was not an infrequent occurrence to have cases admitted to the medical wards suffering from meningitis in which all the classical symptoms were present including turbid cerebro-spinal fluid under pressure, and in the fluid there was a marked increase in the leucocytes, but no organisms. Treated by repeated lumbar puncture, these cases recovered. But, he (the speaker) asked whether they were to be regarded as cases of purulent meningitis? If we went outside the recognised ideas of what constituted a certain condition, we were going to have chaos.

Dr GRAY thought there was an explanation of these cases. There was both a diffuse and a circumscribed form of septic meningitis. If diffuse, then we would expect to find organisms in the cerebro-spinal fluid on lumbar puncture; but if there was a meningitis within a circumscribed area, bacteria and leucocytes would be found in that circumscribed area, and while the leucocytes spread outwards from the granulation tissue round the area into the cerebro-spinal fluid, the organisms would not escape from it because they were kept in by the granulation tissue.

Dr DOUGLAS GUTHRIE asked in what circumstances Dr Syme used collosol argentum. Was it as an antiseptic, and as such, was it more diffusible than other substances?

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Dr LOGAN TURNER joined issue with Dr Harper on the point that organisms were necessary for a diagnosis of septic meningitis. It was possible to have meningitis without finding organisms in the cerebro-spinal fluid on lumbar puncture.

Dr J. S. FRASER said that in an otitis media there was first of all a sero-mucous or sero-hæmorrhagic stage, and that later the exudate became purulent. He thought that these cases of so-called "serous meningitis" without organisms were really cases in an early stage of meningitis. They had not and might never come to the purulent stage if the causal infection was dealt with.

Dr W. S. SYME considered that the cases were those of purulent meningitis because there was pus present. He was careful to state that the spinal fluid was sterile in both. He did not agree that the trans-labyrinthine drainage was uncalled for, because, although there were no organisms in the spinal fluid on lumbar puncture, there were quite possibly organisms in the region of the internal auditory meatus from which they might reach the cerebro-spinal fluid. The reports of this and other Societies show that purulent meningitis has been cured when organisms were found.

Dr ADAM considered that translabyrinthine drainage was the correct treatment in these cases, and he quoted a case which he had seen, in which he regretted that he had not opened the labyrinth.

**Abscess of Mediastinum, causing Œsophageal Obstruction and Death**—W. S. SYME, M.D.—Male, aged 62, with difficulty in swallowing for four weeks; pain in front of sternum. Œsophagoscopy revealed obstruction just below the cricoid, the mucosa appearing as an impermeable web. He died thirty-six hours later, and post-mortem revealed a large streptococcal abscess surrounding the gullet, which the pathologist thought was a week old. There was no lesion to explain the infection, but it seemed probable that a small foreign body, *e.g.*, a fish bone, might have caused it.

Dr MACLAY had recently met with a somewhat similar condition in a lady, who was said to have swallowed a fish bone the day before, and in attempting to find it with the endoscope he encountered a concentric obstruction about an inch and a half below the cricoid. Here the mucosa was inflamed and swollen on the right side to a greater degree than seemed possible in twenty-four hours. No fish bone was visible. At the end of a week an incision in the neck on the right side, about the level of the thyroid, evacuated stinking pus, which the patient had already been bringing up through the mouth. She was improving, and he suggested that the raising of the end of the bed, so that she was practically on her head, had played a part by gravity drainage in preventing the sepsis from going down through the cellular planes.

Dr DONALD WATSON recorded the case of a soldier who had swallowed a fish bone two days before admission. The endoscope was passed and about 2 inches below the cricoid there was a boggy swelling of the mucous membrane. On withdrawing the endoscope, foul-smelling pus was evident

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on the end of it. He complained of pain in the root of the neck, low down on the left side. A left-sided œsophagotomy was performed, and a hole was found in the œsophageal wall about 2 inches below the cricoid. No fish bone was discovered. The patient recovered.

Dr BROWN KELLY recalled a case in which there was a compression stenosis of the trachea and œsophagus, due to a collection of pus between these passages. Tracheotomy was done and half a pint of pus was aspirated. The patient died later and the abscess was found to have originated from cervical caries. In another case of mediastinal abscess, pus was evacuated from the posterior wall of the pharynx and a probe could be passed  $4\frac{1}{2}$  inches down in front of the spine, reaching to between the first and second ribs. The patient recovered.

Dr W. T. GARDINER related the case of an old lady of sixty complaining of difficulty in swallowing. He had difficulty in passing the œsophagoscope but he found no change in the wall and no sign of growth. Next day she had a rise of temperature and died about five days later from mediastinal abscess. At the post-mortem there was a large abscess extending on the left side of the spinal column from the third dorsal vertebra to the seventh. It had a very old thickened wall. The pathologist said it must have been there for at least four months. There was a vague history of a chicken bone having been swallowed months previously. He (the speaker) regretted that he had not first X-rayed the patient.

**Erythema Multiforme Exsudativum**—JOHN L. HOWIE, M.B.  
—Female, aged 25, at intervals of from two to four months for the past three years, had attacks of illness, characterised by feeling of malaise, headache, shivering, pains in back and limbs, associated with œdematous eruption on gums, inside of cheeks, soft palate, sides of tongue and lips, externally involving eyelid, outside of cheeks, with a few eruptions on forearms and hands. Eruption begins as small whitish vesicles which spread rapidly to patches of all sizes and shapes. They are slightly raised and are irregular; of an œdematous appearance and bleed readily when touched. They clear up in about two weeks. Recurrence is preceded by sore throat and swelling of glands in neck. Diagnosis of erythema multiforme exsudativum was made. Soda salicylate prescribed and removal of septic tonsils. There had been two slight recurrences.

Dr J. S. FRASER asked whether other specialists present had been requested to remove tonsils for some of these out-of-the-way skin diseases. He had been asked to remove tonsils to cure prurigo and lupus erythematosus. The prurigo case was not cured and the case of lupus erythematosus died. The latter patient had streptococci in her blood at the time of operation. Dr Cranston Low regarded the present condition as one which recurred, but cured spontaneously, even without enucleation of the tonsils.

Dr A. A. GRAY said that at the present time a number of skin cases were being sent to him for examination of the throat and nose, but he had

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not yet tabulated them. So far, he had not enucleated the tonsils in any of them. There was a case of prurigo recorded in the *British Medical Journal* which got well after removing the tonsils.

Dr BROWN KELLY had the same experience and said that vaccines were being made from the enucleated tonsils. The case shown was important because this affection was apt to be mistaken for syphilis, and what made the diagnosis more difficult was that patients suffering from erythema exudativum were not infrequently syphilitic. Manifestations of skin diseases on the mucous membrane were very difficult to diagnose.

Dr HOWIE referred to the recent paper by Dr Whitton in the *Journal of Laryngology and Otology*. Goitre, rheumatism, epilepsy, etc., were there referred to in this connection. He thought that there was a close connection between rheumatic affections and septic tonsils, but treatment was only in the experimental stage. In this particular case the tonsils were definitely septic, and it was considered at least a very common-sense treatment to remove the septic tonsils and await the results. The attacks had not been so severe since the tonsils were removed.

**Epithelioma of Larynx. Laryngectomy under Local Anæsthesia**—JAMES ADAM, M.D.—Male, aged 51, complained of increasing pain on swallowing, and huskiness for eight months. Growth was seen to involve left half of larynx from ventricular band to near the tip of the epiglottis; no palpable glands. Perfect anæsthesia was obtained by  $\frac{1}{2}$  per cent. novocain infiltration and a few drops of 5 per cent. cocaine injected during operation through thyro-hyoid and crico-thyroid membranes. Feeding tube passed through nose to stomach and left for twelve days. Recovery.

Dr J. S. FRASER asked Dr Adam if he had heard of the good results obtained by Tapia of Madrid from the use of an artificial larynx. He had exhibited, in Paris, some twelve or fifteen Spaniards—all wearing artificial larynges. The patient placed one end of the rubber tube in his mouth, while the other end was connected to the tracheotomy tube. There was an arrangement in the middle of the tube which gave some tone to the voice—rather a nasal tone, like that of Punch. The patients could be heard in any part of the big lecture theatre.

Dr BROWN KELLY said that the vocal cords might assume various positions in whispering. In soldiers with aphonia he had found the cords in positions corresponding to all the functional pareses on whispering.

Dr SYME said that a patient from whom he had removed the larynx two years ago had developed a particularly good pharyngeal voice and could make himself quite well understood both at home and to outsiders. The patient now shown had not yet developed a pharyngeal voice, but it was quite possible that he would.

Dr MACLAY had had personal experience with four cases. Hæmorrhage in the stomach had been described as due to the rubber tube used for



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feeding purposes. He did not see how this could take place with a soft rubber tube. It was unnecessary to put the tube down into the stomach, but it must lie well down in the gullet.

Dr DOUGLAS GUTHRIE said that he had met a gentleman who had been operated upon by Sir Robert Woods four years previously, and he had a remarkably good pharyngeal voice. He was able to make himself understood quite well in French as well as in English, and was even able to take part in discussions.

Dr ADAM wished to emphasise that the anæsthesia was efficient. With one end of a rubber catheter in the tracheal opening and the other passed through one nostril into the pharynx, the patient could speak in a whisper, so that vocal cords were not necessary for whispering. He had refused an artificial larynx. The great difficulty in the operation was the reconstitution of the pharynx.

**Varix in Epiglottic Region**—G. B. BRAND, M.B.—Female, aged 42. First seen in August 1922, complaining of severe recurrent hæmorrhage from mouth. Examination showed large varicose vessels round the base of the epiglottis.

Dr J. S. FRASER said that a number of patients who had been either coughing or "bringing up" blood had been sent to him in the hope that he might find some varicose veins at the base of the tongue or in the pharynx, which might be the source of the hæmorrhage. He had often seen varicose veins, but he had never seen hæmorrhage issuing from them. His experience was that these cases were usually cases of pulmonary tuberculosis and that the blood came from the lung.

Dr SYME thought that in these cases the specialist should be non-committal. He had never seen anything that made him think that the blood was coming from the base of the tongue.

Dr HOWIE thought it was quite permissible to expect hæmorrhage from a vessel in the trachea as well as in the nose. The epiglottis in this case showed loss of tissue and cicatrisation.

Dr BRAND said he distinctly saw blood coming from the big vein when he examined her. There was no doubt about it. The patient had large thin-walled blood vessels over the lingual tonsil and round the epiglottis. He concluded that it was a menopausal condition with high blood pressure. She had probably had an old specific condition, with ulceration of the epiglottis at one time.

**Nine Cases of Retrobulbar Neuritis treated by Sphenoidal Drainage**—GAVIN YOUNG, M.B.—The duration of the eye symptoms in these cases varied from one week to sixteen months. In one case the blindness was bilateral, in the others, unilateral. In only two cases was pus found. Submucous resection of the septum along with removal of the middle turbinal and opening of the sphenoidal sinus was the line of treatment adopted. In only one case (sixteen months' duration) had no improvement in vision resulted.

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Dr GAVIN YOUNG said that in seven of the cases there was no pus to be seen in the nose. There was nothing unusual except a deviation of the septum to one or other side (not necessarily to the affected side) and a large middle turbinal. In one of the purulent cases, where the nose was blocked with polypi, vision was brought from 6/60 to 6/9 on both sides, corrected for astigmatism. The sphenoidal ostium became blocked by the posterior end of a middle turbinal and in one way or another, congestion of the sinus mucosa followed. It was easy to conceive a spread of infection by continuity of the disease of the sinus mucosa to the orbital tissues, and a comparison might be made with cases of neuritis of the facial nerve occasionally seen in acute otitis media. Submucous resection of the septum and removal of the middle turbinal were advisable in order to secure free drainage.

Dr LOGAN TURNER said it was with a feeling of relief that he had heard Dr Young say that only two of the nine cases had obvious sphenoidal disease, because he had begun to think that he must have overlooked a great many sphenoidal cases. In a number of instances the eye changes disappeared without anything being done.

Dr MATHERS asked Dr Young if he ever got anything of value from the radiograms of the sphenoidal sinuses.

Dr DOUGLAS GUTHRIE suggested that Dr Young should pursue the research in conjunction with an ophthalmologist, so that the exact fields of vision before and after operation might be noted, also which part of the field of vision showed improvement. White's results and findings had been seriously challenged by Harvey Cushing.

Dr T. RITCHIE RODGER thought that benefit might follow the operation, even if no pus was found. He had drained the sphenoidal sinus a month ago in a patient, regarding whom two consulting physicians had diagnosed cavernous sinus thrombosis. There was a history of rigor five days before, with rapid onset of blindness and ptosis in the left eye. The ocular movements in that eye were limited to looking downwards and slightly outwards, and only large objects could be distinguished. The right eye was free in its movements, but the temporal side of the field of vision was affected. He (the speaker) questioned the diagnosis in the absence of chemosis and proptosis, and proceeded to the sphenoidal operation with very little hope of doing good. He failed to obtain pus. Within four hours, however, the temperature fell to normal and did not rise again: improvement in the ocular condition was gradual but continuous.

Dr G. EWART MARTIN referred to Dr Sluder's work on *Headaches of Nasal Origin*, and pointed out that it was possible to get a vacuum sphenoid in the same way as a vacuum frontal. Sluder had shown that in these cases it was important to remove the posterior end of the middle turbinal, and to do this he had brought out an operation which was very simple and which was extraordinarily satisfactory. He (the speaker) now performed it as a routine in removing polypi associated with ethmoidal suppuration, opening the ethmoid and also the sphenoid. The technique was very simple and practically free from danger.

Dr ADAM referred to a case of hæmorrhagic retinitis which came on suddenly in the right eye. She had a deviated septum, but no sinusitis

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or pus. She could not see the time on the clock: within two days of resection of the septum she could decipher it, and the fundus of the eye promptly cleared.

Dr W. T. GARDINER said that in his opinion it was not in the least necessary to find pus. The anatomical conditions which Dr Young had described in his paper (*Journal of Laryngology*, December 1922) sufficiently explained how the mildest inflammation of the mucous membrane of the sphenoidal sinus could affect the optic nerve. He (the speaker) did not consider intranasal opening of the sphenoidal sinus a serious undertaking, but it was serious if the patient happened to be one who did not get better but became permanently blind because his sinus had not been opened. He considered that lateral X-ray photographs should be taken more often.

Dr SYME agreed with Dr Gardiner that in these cases of optic neuritis we should certainly remove the middle turbinal and open the sphenothmoidal cell which he thought had even more to do with optic neuritis than the sphenoidal sinus itself. He had opened a great many sphenoidal sinuses and had never seen optic neuritis follow. His own investigations into the sphenoidal sinus threw light upon the readiness with which the optic nerve might become affected, not only on one side but on both. He certainly thought that with optic neuritis where no other cause could be found, an abnormal condition in the nose such as a large middle turbinate with a septal deflection in addition, should be suspected as the cause of obstruction, and that it should be removed and the sphenoidal sinus opened up.

Dr FRASER was sorry to oppose the general opinion which had been expressed. Ophthalmologists expressed the opinion that the great majority of cases of retrobulbar neuritis got well without any operation. Therefore, he thought that Dr Young should have a consecutive series of control cases. In the Royal Infirmary of Edinburgh, the sphenoidal sinus was not opened in cases of retrobulbar neuritis unless there was some local indication for doing so. He wondered how much of the improvement after operation was due to local blood-letting rather than to the drainage of the sinuses when no pus was found. Good radiograms of the sphenoidal sinuses and posterior ethmoidal cells would be a great advantage.

Dr GAVIN YOUNG (in reply) said that this was a question for the ophthalmologists. If they excluded all other causes of optic neuritis and sent the patient to the rhinologist, the latter must treat the case. The neuritis in some of the cases had been going on for a considerable time, in one for a year and in another for six months, and no satisfactory results had been obtained. He did not think radiograms were necessary because the sphenoidal sinus was to be drained in any case. Unless the sphenoidal sinus was very large on the operated side, both sinuses should be drained, because in so large a percentage as 30, the sphenoidal sinus on one side is related to both nerves. He doubted if local blood-letting could be regarded as an explanation in a case which had blindness for twelve months or more.

**Case of Cardiospasm with a Suggestive History—J. A. CAMPBELL MACGREGOR, M.B.** (introduced by W. S. Syme).—Male, aged 64, seen February 1921, complaining of difficulty in swallowing

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solid food. The condition started suddenly eight weeks previously. He could swallow fluids without difficulty, and took only sloppy food. Œsophagoscopy showed the lower end of the gullet greatly distended and containing a mass of food material, some of which had been swallowed two days earlier. The constricted cardiac orifice was found with some difficulty and bougies were passed. The condition was thought to be a carcinoma of the cardiac end of the stomach. At a second examination, one month later, the great distension of the lower end of the œsophagus had disappeared, but it was still dilated and showed absolute lack of tone. The entrance to the stomach was found easily and bougies were inserted. A diagnosis of cardio-spasm was made. Since that date bougies had been passed six times under direct observation.

Seen two months ago, he complained of attacks of hiccough, and again had a temporary attack of dysphagia. Epigastric pain and hiccough follow a meal. The attacks last one to five days.

Dr J. S. FRASER said that the patient was three stones lighter than he used to be, and that he suffered from severe pain in the epigastric region passing round to the back. He suspected an organic lesion to account for the dysphagia.

Dr BROWN KELLY said the disease had developed comparatively quickly; there was great loss of weight and no regurgitation. These conditions were against the presence of true cardiospasm. He suspected malignant disease in the upper part of the stomach as the cause of any spasm that might exist.

Dr DONALD WATSON asked if an X-ray photograph had been taken.

Dr SYME said his first impression was that it was malignant disease at the cardiac end of the stomach, and he held the opinion for some time. The œsophagoscope was frequently passed, and it was only after examining him several times that he came to the conclusion that it was cardiospasm. The history covered nearly two years, and he doubted malignant disease over such a long period.

Dr CAMPBELL MACGREGOR said the patient's loss of weight might be explained by the markedly sub-normal diet he had had to take owing to the frequency of the attacks. Recently he had not lost weight to any extent. There was no cahexia, and this one would expect to find in a case of carcinoma of this duration. Further, there was undoubtedly a hypersensitive point about one inch from the lower end of the gullet, and if it was touched by the œsophagoscope a marked spasm resulted. When the spasm was overcome, the tube passed into the stomach easily.

**"Oculo-Vestibular Co-ordination as a Biological Survival-Factor"**—J. D. LITHGOW, F.R.C.S.E.—(See *Journal of Laryngology*, April 1923, p. 187.)

# ABSTRACTS

## EAR

*Operations on the Temporal Bone carried out with the help of the Lens and the Microscope.* GUNNAR HOLMGREN. (*Acta Otolaryngologica*, Vol. iv., fasc. 4.)

Owing to the small dimensions of such middle-ear structures as the stapes, fenestræ, etc., it is impossible without the help of optical magnification to obtain the precision and security desirable in radical operations involving the tympanic cavity. For more than a year, therefore, the author, in performing the radical mastoid operation, has made use of a binocular lens with magnification of two diameters. The instrument is that devised by the ophthalmologist, Gullstrand, and is worn like a pair of spectacles, giving a stereoscopic picture at a distance of 25 cm. To use the instrument correctly some practice is required; a good light, such as that from a Nernst lamp, concentrated by a lens and reflected into the wound is also essential.

In order to attain a greater magnification a Zeiss binocular microscope has been used, with a magnification of nine diameters, a still higher power being sometimes employed. Small and delicate instruments have also been devised for operating under these conditions.

By the help of the microscope the mucoperiosteum of the tympanic cavity can be completely removed, carious bone can be eradicated from dangerous situations with precision and safety, the tensor tympani muscle and processus cochleariformis can be removed with ease, and the mobility of the stapes and of the membrane of the fenestra rotunda estimated with certainty. The microscope, besides, renders possible the exact performance of various delicate operations which have been suggested and occasionally practised in cases of chronic obstructive deafness, such as the removal of cicatricial tissue from the inner tympanic wall and the establishment of artificial fenestræ.

THOMAS GUTHRIE.

*Spontaneous Rupture of the Internal Carotid Artery, with Hæmorrhage from the Ear.* Dr R. J. HUNTER. (*Laryngoscope*, Vol. xxxii., No. 9, p. 678.)

After reviewing the literature of rupture of the carotid artery the author describes a female patient, aged 45, suffering from lung tuberculosis and a history of five months' ear trouble. The right ear showed a purulent discharge and a swelling of the upper wall; no mastoid tenderness. About half an ounce of blood spurted from the ear while the patient was coughing. Sixteen hours later, hæmorrhage of about 8 ounces; twenty-four hours later, about a pint; six hours later, about 10 ounces; finally, in two hours, 7 ounces.

## Abstracts

The patient became weak and died. The post-mortem showed the mastoid process a large abscess cavity, the anterior wall of the tympanum necrotic, but with no actual dehiscence. The internal carotid artery was ruptured at the first bend of the carotid canal, the perforation being  $3 \times 5$  mm. The perforation was certainly caused by the inflammatory process. No attempt at ligature was made owing to the general condition of the patient. There is an ample bibliography.

ANDREW CAMPBELL.

*On the Condition of the Intact Vestibular Apparatus after the other side has been destroyed, with some Remarks on the Quantitative Estimation of Vestibular Excitability.* Dr JOSEF SPIRA. (*Monatschrift für Ohrenheilkunde und Laryngo-Rhinologie.*)

For the purposes of this investigation the author first tested the value of the Caloric Reaction, according to the method suggested by Kobrak, in fifty normal (or nearly normal) persons. He was thus able to confirm Kobrak's statement that in most cases a nystagmus could be induced by the use of 5 c.c. of water at a temperature of  $26^{\circ}$ . Experience has shown him that it is best to postpone directing the patient to turn his eyes to one side or the other until just before nystagmus can be expected, that is, in some twenty to thirty seconds; and he finds also that he can obtain accurate results by indicating the direction in which he wishes the patient to look with his finger held at about 1 metre distant, and has therefore given up the use of the instrument for this purpose (Blick-Fixator). This method was sufficient in most cases, but in some it was necessary (after a pause of ten minutes) to repeat the irrigation with water at a reduced temperature of  $23^{\circ}$ , or it might be  $14^{\circ}$ ; and if with this no nystagmus was obtainable, he used 10 c.c. of water, varying the temperature as before, as might be required. On the whole he is inclined to agree with Kobrak that in a normal person a nystagmus can always be induced with 5 c.c. of water at  $27^{\circ}$ , though the duration of such nystagmus varies.

He then tested eighteen patients in whom one labyrinth was functionless from various reasons. In all these cases he was able to obtain, by the above method, a nystagmus directed towards the injured side, on irrigation of the sound ear; but in all of these a temperature considerably lower than  $27^{\circ}$  was found necessary.

The response of rotation was also tested with the usual expected results in these cases.

The author considers that it is fair to suggest from these investigations, though he admits the number of cases on which his remarks are based are small, that, with unilateral destruction of one labyrinth (the causal agency of which is unimportant) the response of the

## Ear

sound ear to caloric stimulus is in certain cases at any rate depreciated : the cause of this is unknown, probably it is to be chiefly referred to some central lesion. He trusts that other investigations on the same lines may tend to solve the problem.

ALEX. R. TWEEDIE.

*The Prevention of Nausea following Vestibular Stimulation.* HEINRICH FISCHER and ERNST WODAK. (*Münch. Med. Wochenschrift*, Nr. 11, Jahr. 69.)

The writers have successfully overcome the nausea and its attendant ills which often succeed vestibular stimulation by ensuring a faultless fixation of the patient's head. This can be best achieved by fixing a metal receptacle containing some warm "Stent's Composition" to an upright from the examination chair and getting the patient to bite into same. In this manner it is possible to obtain a perfect immobility of the patient's head.

JAMES B. HORGAN.

*The Caloric Labyrinth Tests with Minimal Stimuli.* N. D. DÉMÉTRIADÉS and PH. MAYER. (*Monats. f. Ohrenh.*, Year 56, No. 6, 1922.)

This article is based on the results of the examination of 150 patients, according to the method of Kobrak, with 5 c.c. of water at from 13 to 15° C., the stream being directed towards the postero-superior part of the wall of the external meatus, so as to avoid, as much as possible, direct pressure on the tympanic membrane. In the hot water reaction, water at from 38 to 45° was used. The procedure was as follows :—

A note was first made as to the presence of compression nystagmus, and five minutes allowed to elapse before testing the caloric reaction with the 5 c.c. of water at 13°. In a few cases only was it found necessary to employ a further similar amount at 25 to 30°, and if, after two minutes, no reaction with the latter was obtained then a still greater quantity of water at the same temperature was used. Between testing the two ears some five to ten minutes' pause was made. The following points were noted :—

1. The nystagmus.
2. The effect of the position of the head on the nystagmus.
3. The pointing test in the shoulder-joint.
4. The falling reaction.
5. The sensation of giddiness.

As a control, fifteen people with healthy ears were tested. In these it was found that on the average, after 3 c.c. of water at 13°, nystagmus of the first grade was induced in from 25 to 40 seconds, and lasting from 40 to 90 seconds; whilst nystagmus of the second

## Abstracts

grade appeared in from 15 to 30 seconds, with the use of 5 c.c. of water, which lasted 60 to 120 seconds.

No giddiness, falling reaction, or by-pointing occurred in any of these cases.

An account then follows of particular pathological cases with critical remarks. The article terminates with the following conclusions:—

1. The compression test only seldom affords a trustworthy result, but is then of great clinical value.
2. It is important always to use water at the same temperature—13 to 15° being recommended.
3. The optimum position of the head can be advantageously combined with the method of Kobrak.
4. The hot caloric test gives uncertain results, and is unnecessary for purposes of diagnosis.
5. In normal cases 5 c.c. of water at 13 to 15° induces a nystagmus in from 15 to 30 seconds, which lasts from 60 to 120 seconds.
6. Neither giddiness, by-pointing, or falling reaction is induced by this method.
7. In cases of chronic suppurative otitis media the induction period is reduced, but the duration of the nystagmus, in most cases, is normal.
8. No effect may be induced in cases of inner ear disease by Kobrak's method, but a reaction is obtained by larger amounts of water.
9. The duration of the latent period is dependent on both the extra- and intra-labyrinth condition.
10. Cases of even advanced extra-labyrinth lesions react to Kobrak's method.
11. The duration of the latent period is dependent on the excitability of the peripheral sense organs; the duration of the nystagmus on the sensibility of the central nervous system.
12. The hyper-excitability of the peripheral sense organs is usually associated with a central hyper-sensibility or normal sensibility, as is also a hypo-excitability of the peripheral sense organs, commonly found in connection with a central hypo-sensibility.
13. Slight hyper-excitability of the labyrinth is characterised by a shortening of the latent period (under ten seconds) and the occurrence of giddiness, falling reaction, and by-pointing; whilst more advanced cases show a still shorter latent period and marked lengthening of the duration of the nystagmus. Slight labyrinth hypo-excitability conversely is characterised by a shortened duration of the nystagmus, whilst still slighter degrees of excitability are evidenced by the shortened



# Pharynx and Nasopharynx

duration of nystagmus, and marked lengthening of the latent period.

14. The horizontal-rotatory nystagmus induced by the caloric test can only be transformed into a horizontal nystagmus, by inclining the head towards the shoulder of the side being tested, in 50 per cent. of cases. Alteration of the direction of the nystagmus can only very seldom be affected with certainty.

The article contributes some very valuable data towards the standardisation of the cold caloric test, but unfortunately no mention seems to be made of the rate or pressure at which the irrigation was conducted.

ALEX. R. TWEEDIE.

## PHARYNX AND NASOPHARYNX.

*The Bacteria of the Tonsils and Adenoids.* NELLIE WALL, M.Sc., M.B. (*Brit. Med. Journ.*, 25th November 1922.)

The results are tabulated of the examination of the tonsils removed from children under sixteen years of age, at an out-patient department and at school clinics, the methods of culture being given in detail.

Tubercle bacilli were found in 2.5 per cent., and in the positive cases there was neither clinical evidence nor history of tuberculosis.

Streptococci and *Micrococcus catarrhalis* were the most constant organisms, both on the surface and in the depths of the crypts, and were each present in over 95 per cent. of cases.

*Staphylococcus aureus* and *albus* — *Micrococcus flavus* and pneumococcus were each represented in over 50 per cent., while *B. influenza*, meningococcus, and *B. coli* were present in 10 per cent.

T. RITCHIE RODGER.

*Quantitative Bacteriology of the Tonsils.* H. D. CAYLOR, M.D., and GEORGE F. DICK, M.D., Chicago (*Journ. Amer. Med. Assoc.*, Vol. xxviii, No. 8, 25th February 1922).

An investigation of the significance of the number of bacteria present in the interior of the tonsil was made, and an endeavour to determine more accurately the sort of tonsils that are a menace to health, and those comparatively harmless. This was used as an index to the degree of pathological change in the gland.

A table is given showing the relation of bacterial counts to the size, weight, and pathological change in the tonsils, the type of organism predominating, and the presence of disease in other parts of the body. The table shows that the tonsils from patients who complained of recurring sore throat, or who had at the time of operation enlarged cervical glands contained from two to twenty times as many bacteria per gram as those without the clinical history.

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There is no apparent relation between the number of bacteria per gram of tonsil and the type of organism predominating on the plates, nor is there any apparent relationship between types of bacteria and the clinical condition of the patients or pathological condition of the tonsils. Those showing the highest bacterial contents per weight were the relatively small tonsils in which chronic inflammatory changes had occurred.

The Authors' conclusions are as follows:—The results of this work indicate that tonsils should not be regarded as harmless because they are small. It is often impossible to express pus from smaller tonsils, because drainage of the crypts is prevented by fibrous tissue. The total bacterial content, as well as the number of bacteria per gram, may be much greater than that of large tonsils.

Quantitative is of more aid than is qualitative bacteriology in determining the condition of tonsils that have been removed and in determining their possible relation to disease elsewhere.

PERRY GOLDSMITH.

*Radium Treatment of Diseased Tonsils.* CARL F. ROBINSON. (*Amer. Journ. of Roentgenology*, Sept. 1922.)

A series of 75 cases of enlarged and diseased tonsils was treated by radium.

In small children, a 50-mgrm. tube screened with 0.4 silver, 1 mm. brass, and 1 mm. rubber was applied externally over the tonsil for six to ten hours. Thirty cases were treated and 25 were cured.

The needle method was used in 25 cases. It consists in the introduction of two 12.5 mgrm. radium needles into the centre of each tonsil. Those are left in position for two to four hours. The radium applicator, by which the element is held directly against the tonsil, was employed in 20 cases. The writer strongly recommends this method of treatment on account of its safety, simplicity, and painlessness.

DOUGLAS GUTHRIE.

*Roentgen Ray Treatment of Chronically Infected Tonsils and Adenoids.* C. G. WATERS, P. B. MACCREADY, and C. H. HITCHCOCK. (*Amer. Journ. of Roentgenology*, August 1922.)

This paper is based upon the cases treated by roentgenotherapy. There was a decrease in the size of the tonsils, especially in the large cellular variety, and when the symptoms are due to the hypertrophy alone the results were good.

X-ray treatment of tonsils and adenoids may be useful when surgical interference is contra-indicated.

The cure of tonsillar sepsis cannot, however, be achieved by this method of treatment, the tonsils remaining infected and their bacterial flora unchanged.

DOUGLAS GUTHRIE.

# Pharynx and Nasopharynx

*The Treatment of Peritonsillitis.* HEINZ DAHMANN. (*Munch. Med. Wochenschrift.*, Nr. 11, Jahr. 69.)

The treatment advocated by Dahmann may be summarised as follows. In all cases conservative treatment is tried in the first instance. In the likelihood of pus being present, an exploratory puncture is made with a trocar and cannula. If pus is present, and if the abscess cavity extends well forwards, it is opened through the anterior faucial pillar, provided that an early tonsillectomy is not in question, and that it is the patient's first attack of peritonsillitis.

If the abscess lies in the proximity of the upper pole of the tonsil, if the anterior pillar has been incised on several previous occasions, and if an early tonsillectomy is undesired or contra-indicated, the abscess is opened via the supra-tonsillar fossa.

The upper pole of the tonsil is in all cases freed or luxated from the tonsil fossa. This manoeuvre is also carried out in those cases of primary peritonsillitis in which it is intended to perform a subsequent tonsillectomy.

JAMES B. HORGAN.

*The Clinical Importance of Ossification of the Stylohyoid Ligament.* BENJAMIN LIPSHUTZ, M.D., Philadelphia. (*Journ. Amer. Med. Assoc.*, Vol. lxxix., No. 24, 9th Dec. 1922.)

Attention is directed to the possibility of this condition producing pharyngeal distress when the process is longer than normal and medially directed. It then lies in intimate relation to the faucial tonsil. One must remember the existence of the sub-pharyngeal cartilage of Luschka which occurs not only in the lateral wall of the oropharynx somewhat below and behind the tonsil, but also in the tonsil itself. Luschka's cartilage is hyaline in type embedded in a capsule of white fibrous tissue, and is believed to be a vestige of the third post-aural arch.

PERCY GOLDSMITH.

## LARYNX.

*On the Form and Dimensions of the Ventricle of Morgagni.* Dr S. BELINOFF. (*Monats. f. Ohrenh.*, Year 56, No. 6.)

The Author has investigated the anatomy of this part of the Larynx in 56 cases, by means of plaster of Paris casts taken after death in patients, who had died from various causes.

After a short historical and critical review he summarises his conclusions in the following remarks:—

1. The variations of the Ventricle of Morgagni, both in shape and size are numerous, and cannot be accurately shown by sections.

2. Casts give a more accurate result, for which purpose plaster of Paris is preferable. Some better material, however, should be found since even this does not reach all the ramifications of the ventricle.

## Abstracts

3. The Ventricle of Morgagni is larger than is generally represented in literature. It can best be compared to a three-sided pyramid. The upper and lower walls have already been recognised, but the lateral wall has never yet been described. The casts show that this wall is usually present and averages a height of 8 mm.

ALEXANDER TWEEDIE.

*Diathermy Cautery Puncture in Tuberculous Laryngitis.* A. HOFVENDAHL. (*Acta Oto-laryngologica*, Vol. iv., fasc. 3.)

As compared with the galvano-cautery, surgical diathermy offers the following advantages:—(1) The depth and direction of the effect can be controlled by regulation of the strength of the current, and by selection and adjustment of the indifferent electrode. (2) The coagulation of tissue is much more extensive than by the electro-cautery. (3) The protecting epithelium may remain uninjured when an electrode is used only the terminal portion of which is active, the proximal portion which lies in the epithelium being insulated. (4) The destructive effect is so widespread that a single puncture may suffice and frequent repetition is not required. (5) In infiltrations on the posterior wall the puncture, being free from pain, can be carried out with exactitude to the required depth. (6) The annoying smoke associated with the galvano-cautery is entirely absent in diathermy. The treatment is free from pain after efficient cocainisation, and subsequent pain and swelling of the surrounding tissue are slight.

THOMAS GUTHRIE.

*Intra-tracheal Struma.* E. WÜRSTER. (*Münch. Med. Wochenschrift*. Nr. 38, Jahr. 69.)

This is the twenty-seventh case recorded in literature.

The affection may be due either to an invasion of the tracheal lumen by a portion of the thyroid gland or to the dispersal of embryonic rests in this region. The tumour usually grows from the anterior wall between the cricoid and the upper four tracheal rings, it is always encapsulated and is covered by movable mucous membrane. Malignant degeneration has only once been observed.

A suspicion that such a tumour exists should be aroused if the dyspnoea present is out of proportion to the size of an existing external struma. The diagnosis is confirmed by the use of the laryngoscopic mirror. A lateral radiograph affords valuable information.

If symptoms of stenosis exist the tumour should be removed by tracheotomy after the division of its covering mucosa. In severe cases a preliminary low tracheotomy is unavoidable.

JAMES B. HORGAN.

## REVIEWS OF BOOKS

*Instruments and Personal Methods in the Diagnosis, Prognosis and Treatment of Aural Disease.* J. MOLINIÉ. Paris, 1922.

The pioneers of otology conducted exhaustive researches into certain non-suppurative diseases of the middle ear, with singularly unproductive and disheartening results. Even at the present day, so few real advances in treatment have been achieved, that this particular branch of medical science is commonly regarded as a limbo, with portals bearing the grim inscription "lasciate ogni speranza."

Molinié exhorts his readers to renewed efforts. He claims, apparently with every justification, that considerable refinement of technique is rendered possible by his magnifying binocular otoscope and his instruments for mobilising each ossicle separately. The otoscope, of prismatic construction, is fitted with an electric headlight and is supported on a head band. The binocular image which it affords facilitates direct instrumental movement of each ossicle, which, according to Molinié, is a great advance on the methods of Siegle, Delstanche, and Lucae.

For teaching purposes lateral prolongations enable an observer on each side of the examiner to share the view. Judging from the illustrations, the otoscope is also well adapted, as its designer intends, for all forms of endoscopic work.

The book, which contains ninety pages, gives various notes on the application of electricity in chronic aural disease.

WM. OLIVER LODGE.

*The Reports of the Oto-rhino-laryngological Clinic of the University of Rome.* Directed by Professor GHERARDO FERRERI, 1921. Pp. 522. Rome, 1922.

These reports, consisting of a series of original papers by various oto-laryngologists and the statistical reports of the clinic for the years 1920-1921, are dedicated to the "Sacred Hand of Dante," who is credited with having reproduced all the sounds of Infinite Nature in his poetry.

A preface by Professor Gherardo Ferreri deplores the low position the Specialty holds in the world of Medicine. He states that the exponents of oto-laryngology devote their time and attention solely to money-making, with the result that there is very little teaching and research done, and the work lacks the stimulus of emulation. He pleads for a reformation so that oto-laryngology shall again occupy a high position in Medicine.

The reports open with a long paper by Bilancioni who discusses the references to the voice as spoken and sung in Dante's works. There is a most exhaustive series of quotations which show the beauty

## Reviews of Books

of Dante's language, and how he pondered over and worked upon the production and perception of sound.

Gherardo Ferreri contributes articles on the prevalence and type of aural disease among the labouring classes, and on the extra- and intra-cranial complications of suppurative otitis media in infants and in adolescents, giving his technique in the treatment. He is enthusiastic in his praise of vaccine-therapy in certain types of otitic suppuration.

Bilancioni records two cases of uncontrollable sleepiness due to very old otitis and fistulæ in the horizontal canal in each case. Both were cured by radical mastoid operations. He also records some unusual laryngeal and respiratory symptoms of chronic epidemic encephalitis; and reproduces a thesis by Michele Rosa, in the original Latin, on the "Organs of Sense," written in the latter part of the eighteenth century.

Giorgio Ferreri reports three cases of lympho-sarcoma of the pharynx, two of which were cured by deep radio-therapy, but the third, with secondary deposits in the spleen, died; he also describes a method of treating pharyngomycosis of an ulcerating type by deep radio-therapy, after attempts with salvarsan had failed, and suggests that this method might be applied to other parasitic conditions.

Michele Manconi has investigated groups of ganglion cells which occur in the intrinsic laryngeal muscles of the cat. Many of them are unipolar, the single process bifurcating like a posterior root ganglion. He proves that their fibres do not terminate in the motor end-plates of the muscles and that they are not part of the sympathetic system; he concludes that they are a part of the extremely delicate defensive scheme of the larynx. He contributes a paper on growths of the naso-pharynx, in particular fibro-endotheliomata (the usual type of fibroma), and relates two cases with notes on the pathology.

Massino Campeggiani relates cases of secondary deposits of thyroid structure in various regions, and discusses the pathology.

Salvatore Traina has found acetone in the urine of small children with adenoid enlargement; this condition cleared up after removal of the adenoids. He also gives his experiments on the action of the vagus and sympathetic on the vestibular labyrinth, using adrenalin and pilocarpin to produce his results.

The reports are illustrated with a few diagrams and some excellent micro-photographs. One of the most interesting points in these reports is the inclusion of diseases of the tongue and floor of the mouth in the scope of the clinic. In other respects the proportion of the different types of case seems to be very similar to that in a British clinic.

Each paper has a good bibliography, British and American writers being freely quoted, and there is a list of papers published by Italian oto-laryngologists during the year.

F. C. ORMEROD.

## GENERAL NOTES

ROYAL SOCIETY OF MEDICINE,

1 Wimpole Street, London, W.1.

*Section of Otology*—*Chairman*, Sir Charles Ballance, K.C.M.G. *Hon. Secretaries*, F. J. Cleminson, M.Ch., and Archer Ryland, F.R.C.S. Ed. The next Meeting of the Section will be held on Friday, 20th April, at 5 P.M.

Members intending to show cases or specimens are requested to give notice of the same to the Hon. Senior Secretary, Mr F. J. Cleminson, 32 Harley Street, London, W.1, at least twelve days before the date of the Meeting.

*Section of Laryngology*—*President*, Charles A. Parker, F.R.C.S. Ed. *Hon. Secretaries*, T. B. Layton, D.S.O., M.S., and J. F. O'Malley, F.R.C.S. The Annual Meeting of the Section will be held on Friday, 4th May, at 4.45 P.M.

Members intending to show cases or specimens are requested to give notice of the same to the Hon. Senior Secretary, Mr T. B. Layton, 10 Welbeck Street, London, W.1, at least twelve days before the date of the Meeting.

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### SUMMER MEETING OF THE SECTION OF LARYNGOLOGY, MANCHESTER, June 1923.

The Annual Summer Meeting of the Section will be held at Manchester on Friday and Saturday, 15th and 16th June.

Papers will be read and discussed on the morning of the 15th, and Clinical Cases will be demonstrated in the afternoon. On the morning of the 16th, further papers will be read and the Meeting will close at 1 P.M., unless it should be found necessary to adjourn the sederunt until after luncheon.

All who are interested in Laryngology will be cordially welcomed.

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### BRITISH MEDICAL ASSOCIATION, PORTSMOUTH, 1923.

The Ninety-first Annual Meeting of the British Medical Association will be held at Portsmouth in July, under the Presidency of Mr Charles P. Childe, F.R.C.S., Senior Surgeon to the Royal Portsmouth Hospital. The President will deliver his Address on the evening of Tuesday, 24th July, and the Sectional Meetings for scientific and clinical work will be held on the following days.

Mr Ernest B. Waggett, D.S.O., M.B., Ch.B. (London) has been elected President of the Section of Laryngology and Otology.

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The American Laryngological, Rhinological, and Otological Society meets at the Hotel Ambassador, Atlantic City, on 10th, 11th, and 12th May 1923. Dunbar Roy, M.D., Atlanta, Ga., President. William H. Haskin, M.D., New York City, Secretary.

## General Notes

The American Otological Society meets at the Hotel Ambassador, Atlantic City, 14th and 15th May 1923. George E. Shambaugh, M.D., Chicago, President. Thomas J. Harris, M.D., New York City, Secretary.

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The American Laryngological Association meets at the Hotel Ambassador, Atlantic City, 16th 17th and 18th May 1923. Emil Mayer, M.D., New York City, President. George M. Coates, M.D., Philadelphia, Secretary.

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The Section of Laryngology and Otology of the American Medical Association meets in San Francisco, 25th June 1923. William B. Chamberlain, M.D., Cleveland, Ohio, President. Samuel Iglauer, M.D., Cincinnati, Secretary.

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The American Academy of Ophthalmology and Oto-laryngology meets in Washington, D.C., October 1923. Thomas Carmody, M.D., Denver, Colorado, President. Luther C. Peter, M.D., Philadelphia, Pa., Secretary.

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### THE LATE HUNTER F. TOD, F.R.C.S.

At the Meeting of the Section of Otology of the Royal Society of Medicine held on the 16th February, the following appreciation of the late President of the Section was delivered from the chair by Sir Charles Ballance, K.C.M.G.

"The British race are by nature shy and reserved. Of all the sections of our people, perhaps those who belong to the medical profession are more shy and more reserved than any other. But this afternoon I must speak to you without reserve. I could not do otherwise if I would. The words which I have put together are, to me, pregnant with emotion and come from my heart.

"Sorrow and gloom encompass our meeting to-day. I have the saddest of all duties to perform. It is to tell the members of the Section of Otology that the gallant spirit of our President has

'Gone before

To that unknown and silent shore'

and

'Joined the choir invisible.'

A community, such as the Otological Section of the Royal Society of Medicine, is endowed with continuous life, but with a life of ever-changing form. The individual members pass away, but the body corporate remains. Each member of our community contributes to the completeness of the body corporate, and herein it is that the death of any one of us, and especially such a one as Hunter Tod, leaves so great a void.

"It was my privilege to know our President well, both in his professional and private life, and I deeply mourn the loss of my friend. During the last few years he was often in my house, and on each occasion a merry freshness and happiness seemed to emanate from his presence. In fact,



## General Notes

a visit from Hunter Tod was ever a welcome tonic, for he was one of those who 'make undying music in the world.'

"Our President revelled in the game of life. He played it from start to finish right strenuously and with zeal and enthusiasm, like a knight of the olden time. Incidentally I may mention that his fighting instincts were often used with success to increase the prestige of our specialty; while his intellectual gifts, his wide range of clinical experience, and his skill as an operator, were devoted to the science and art he loved so well.

"During all his long and painful illness no word of complaint ever passed his lips. His 'courage mounted with occasion.' It was of that type which never submits and never yields. Even to the last he met me with a smile.

"The web of life is a mingled yarn, good and ill together.' 'It is a battle and a sojourning in a strange land.' The last fifteen months have been overfull of ill for our martyred President. He passed through mental and physical anguish to the better land, triumphant and victorious. His strength was made perfect in weakness.

"At the zenith of his career, and at the moment of his greatest professional success, 'Fortune, that lays in sport the mighty low,' brought to this lovable colleague of ours the unrelenting foe of a fell disease, and, lastly, death itself. But there is a golden lining to all this story of long-drawn-out tragedy.

"Though our President knew that the field was lost, and spite of all 'the slings and arrows of outrageous fortune' which it was his hard lot to bear, his unconquerable mind, 'freedom's holy flame,' remained tranquil and undismayed. He uttered no regrets. And when the time came when he was forced to lay down the armour and weapons of this world he 'let them go—gain, fashion, pleasure, power.'

"A rare and valiant character, a brave heart, and a high and noble courage this!

"The progress of medicine in the present day rests in great part on the labours of past generations. As Carlyle so well said, 'The craftsman there, the smith with that metal of his, with these tools, with these cunning methods—how little of all he does is properly his work. All past inventive men work there with him; as indeed with all of us in all things.' During the American Civil War one of the most famous songs of the soldiers of the North was, 'John Brown's body is mouldering in the dust but his soul is marching on.' May we not believe, yea, rather, we know, that the soul of our President will be with us in the coming years. For it is a sure and certain truth that the spirits of the great aural surgeons of the past have been with us and are with us still, vitalising and energising the labours of those who now contribute to the progress of our science and art."

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THE LATE HENRY LOWNDES LYNNAH, NEW YORK.

American Laryngology has to deplore the loss on 31st March 1922 of one of its most promising younger men in Henry Lowndes Lynnah. When I was in the States, in the summer of 1919, I came across many colleagues whom I had known as the leaders of the Old Brigade. J. Solis

## General Notes

Cohen remains the vigorous *doyen*, though nearly ninety years of age. Bosworth must have passed his fourscore years; while French and Beverley Johnson (both of New York), with Nolan Mackenzie and Samuel Johnston (both of Baltimore), are vigorous laryngologists, although they have reached the psalmist's threescore years and ten.

In the next division the present-day leaders are all well known to us either personally or by reputation. From them I enquired as to who was the most promising amongst coming men? Almost with one accord they referred me to Lynah, and it was remarkable that his pre-eminence amongst his contemporaries was so universally conceded. The hearty welcome which he gave me enabled me to watch his excellent clinical work, and I was soon satisfied that their judgment was well founded. His knowledge and refined skill in endoscopic work was only second to one other man in his own country, and, we may therefore say, he was the second most eminent in the world. At the Willard Parker and Riverside Hospitals I saw his skill in the Department of Intubation and his success in dealing with the stubborn and serious cases of laryngeal stenosis. We have much to learn from our American colleagues regarding this obstinate and troublesome condition, as they appear to have more clinical material than we have. It is doubtless owing to the fact that O'Dwyer was a New Yorker that our confrères on the other side employ prolonged intubation more than we do.

It was delightful to note my young colleague's enthusiasm in his work and the pleasure that he evinced in welcoming anyone from the old country. His personal charm, of course, added to the attraction. I was at once impressed with his sincerity, his well-balanced judgment, and the reliability of his records.

Lynah was a Southerner, having been born and educated in South Carolina, and it was charming to see the affection he retained for that sunny State. He was only 41 when I met him, on the high tide of success, after many years of strenuous life.

I made up my mind that if ever asked who should be invited to come over from America to give us an Address on Stenosis of the Larynx or Trachea that I would warmly recommend the invitation being extended to Dr Lynah.

He is now dead at the early age of 44. All who knew him will feel a deep sympathy for the parents with whom he lived—he was never married; his friends will feel the tragedy of his early death; and American Laryngology thoroughly realises the loss of one of its best-loved and most promising sons.

Dr Bryson Delavan writes to me as follows:—"No tribute of mine could do justice to the memory of Lynah, nor give adequate expression to our affection for him and our poignant grief at his untimely ending. But those nearest to him have the proud consciousness that, great as is the loss to them and to the world, he has left a name which will remain."

Further interesting particulars will be found in the full Obituary Notice in the volume of the *Transactions of the American Laryngological Association*, 1922, written by his devoted senior and admiring friend, Dr Arrowsmith. In the *Laryngoscope* for June, 1922, there is a Bibliography of his writings. They are well worth reading.

ST C. T.

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## SOME OBSERVATIONS ON MEAT AND FISH BONES IMPACTED IN THE ŒSOPHAGUS

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With a note on the X-Ray Diagnosis by C. THURSTAN HOLLAND, Ch.M.,  
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WHEN one considers how often fragments of meat and fish bone must be swallowed with the food, it is not surprising that their arrest in the œsophagus should be a comparatively common accident. Yet those which become arrested in this portion of the alimentary tract probably represent a comparatively small proportion of the number actually swallowed. In some carnivorous animals, like the dog, large numbers of bony splinters are swallowed daily with impunity, and although the human œsophagus is probably much less tolerant, the great majority of such foreign bodies doubtless negotiate the passage unnoticed. Arrest is likely to occur only when, on the one hand, the bone possesses sharp angles or is of large size, and, on the other, when the œsophagus is narrowed by pre-existing disease.

From the clinical standpoint cases of bone in the œsophagus do not differ very materially from those in which foreign bodies of other kinds have become impacted, yet they do present certain distinctive features which seem worthy of special consideration.

(1) The history of the case, as a rule, consists only of the patient's statement that, while swallowing a mouthful of meat or fish, he felt a sudden sharp pain in his throat or chest, as though something had become arrested; and that, since then,

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he has suffered from more or less complete inability to swallow with pain on attempting to do so. Thus, while in most other cases of foreign body, such as coins, pins, or tooth-plates, the surgeon has beforehand usually some idea of the size and shape of the intruder and the mechanical difficulties to be overcome in its extraction, in cases of meat and fish bone these facts must remain unknown until they are disclosed by direct inspection with the œsophagoscope.

(2) On the other hand, the patients are in a large proportion of the cases edentulous; the absence of dental sensation no doubt rendering more difficult the detection of hard substances in the food. From the point of view of the œsophagoscopist this is of course a decided advantage, since the distal end of the tube can be moved and adjusted with greater freedom and accuracy when the proximal end is unhampered by the presence of teeth.

(3) Impacted bones seem peculiarly apt to cause rapid inflammatory changes. Many cases are on record in which bodies such as coins and dentures have remained in the œsophagus for long periods without causing any very serious consequences. On the other hand, the organic matter adherent to and incorporated with bones undergoes rapid decomposition, and septic infection of the mucous membrane is an early consequence, especially if its surface has been perforated or lacerated by sharp spicules or projections. The result is a rapid onset of inflammatory swelling, œdema, and ulceration, all of which increase both the difficulty and the risk of extraction. This being so, not only are blind attempts at removal more hazardous, on the average, in such cases than in those of impacted metallic or other inorganic foreign bodies, but removal under direct inspection with the œsophagoscope is a matter of even greater urgency and should be carried out with the least possible delay.

(4) The difficulty of the case with an impacted bone, when it comes for treatment, has not infrequently been rendered greater by previous ill-advised attempts to "push down" the intruder. The patient with an impacted body such as a denture, coin, or pin, will rarely attempt, by swallowing masses of bread or other soft food, to force it down the œsophagus. A bone, on the contrary, appears often to be dealt with in this way, the idea being no doubt that as it forms part of the food, it may be induced by such means to pass on, when retching efforts fail to persuade it to return. It must be admitted that the medical





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attendant also is occasionally not wholly free from some such idea, and it is, in my experience at least, usually in cases of impacted bone that attempts to "push it down" with a bougie or probang have been made before the case reaches the œsophagoscopist. It may be questioned whether or not the patient can do much harm by swallowing bread and such like, although it is easy to imagine that a sharp spicule might become further embedded by such means; there is, however, no doubt at all that the probang has been, and unfortunately still is, responsible for irreparable damage in these cases. The dangers of its use are so obvious and have been so often demonstrated that they require only a passing reference.

(5) In most of my cases pain has been a marked feature, and in many of them it has been persistent and not only associated with swallowing. Continued pain, apart from and accentuated by swallowing efforts, is certainly extremely suggestive of the presence of a foreign body. A scratch or wound of the œsophageal mucous membrane caused by a foreign body which has afterwards become dislodged and passed on, may give rise to considerable dysphagia, but is rarely attended by persistent pain.

The pain is usually referred with fair accuracy to the site of the trouble, although in this matter complete reliance cannot, of course, be placed on the patient's statements. It is especially severe when the bone is at the upper end of the œsophagus, and encroaches on the post-cricoid region, since in this situation it is apt to be gripped by the lower constrictor muscle of the pharynx, the spasmodic contractions of which, even on attempted phonation, press the sharp angles of the bone still deeper into the mucous membrane. This was very striking in cases Nos. 7 and 10, in one of which a chicken bone, and in the other a rabbit bone, was fixed partly in the upper end of the œsophagus, and partly in the lower pharynx.

(6) As a means of diagnosis in cases of bone in the œsophagus the X-rays are of the utmost importance. Owing to its comparatively small size and lack of density, the bone itself very rarely casts an appreciable shadow, yet information of the greatest value may be obtained from a properly conducted X-ray examination. In the great majority of my cases I have been most fortunate in having the help of Mr Thurstan Holland, and he has very kindly complied with my request to write a description of the technique he employs.

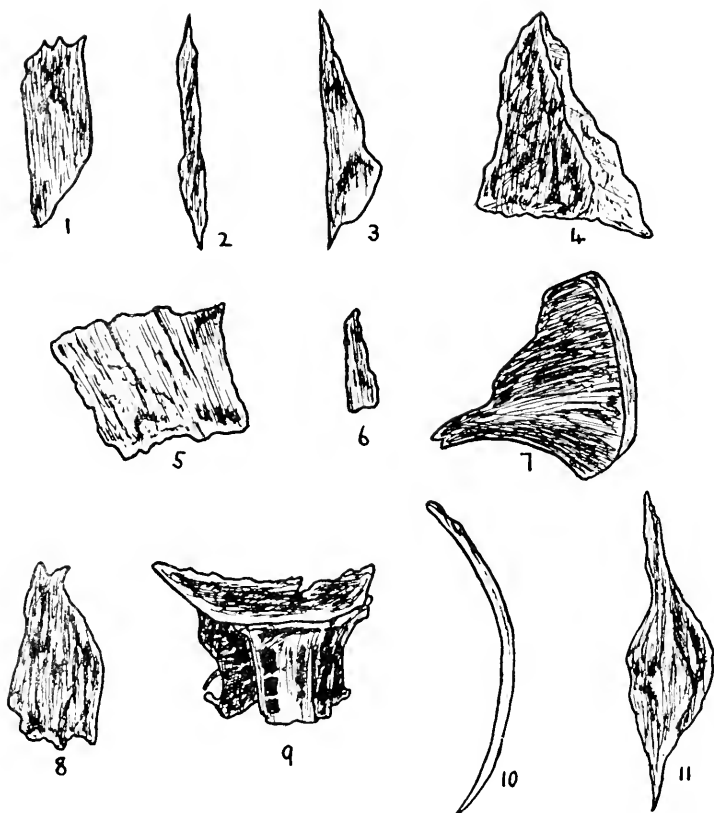
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The routine method of examination which he has developed, appears to me so perfect and gives such excellent results that I feel sure his own account of it will be appreciated. I may say that I have come to place the greatest reliance on his opinion in these cases, and I cannot recall any case in which his report that the X-ray evidence pointed to the presence in the œsophagus of a non-opaque foreign body did not prove to be correct. It is perhaps hardly necessary to insist that the X-ray examination should precede the attempt at removal by as short an interval as possible, so that there may be little likelihood of the situation of the bone having altered before œsophagoscopy is undertaken.

(7) As regards treatment, it goes without saying that removal of the bone under direct vision by means of the œsophagoscope is the only permissible method. In all but very exceptional cases, a general anæsthetic is, in my opinion, advisable. It abolishes or reduces spasm, allows of more deliberate manipulations, and eliminates voluntary or reflex movements on the part of the patient which may hamper the operator, and add to the danger of serious damage. Given a skilled anæsthetist accustomed to cases of this kind, the risk attending a general anæsthetic appears to me so small as to be practically negligible. In a series of cases examined and treated by bronchoscopy and œsophagoscopy during the past sixteen years, I have never regretted the use of a general anæsthetic nor suffered anxiety from this cause. Some patients are, no doubt, sufficiently apathetic to tolerate these procedures in the absence of general anæsthesia without much complaint, but in many others the mental and physical suffering are not only real but considerable. It is a not infrequent experience that the nervous equilibrium of some patients may be disturbed for many months, following a prolonged operation of any kind under local anæsthesia, even though attended by little or no pain or discomfort, and certainly œsophagoscopy for removal of a foreign body in the absence of general anæsthesia is not free from this risk.

(8) Owing to the early onset of inflammatory reaction, to which reference has already been made, the mucous membrane at the site of impaction is apt to be softened and friable, so that instrumentation must be especially gentle in order to avoid further damage. This is particularly the case when the sharp ends or corners of the bone are deeply embedded, as





The above illustrations represent specimens of bones removed from the œsophagus. No. 7 is a chicken bone, No. 9 a fish vertebra, and No. 10 a rabbit's rib, the rest being fragments of beef or mutton bones. The ages of the patients ranged from fifteen years (No. 4) to fifty-four years (No. 8). In the case of Nos. 6, 7, 9 and 10, the bone lay either at the upper end of the œsophagus or partly there and partly in the lower pharynx; in the remainder it was situated about the level of the manubrium sterni. The foreign body had been in position for periods varying from two or three hours to five days (No. 9). As already remarked, pain was an especially marked feature in the four cases in which the bone was situated high up in the œsophagus. Inflammatory reaction was most marked in case No. 6, a definite abscess discharging foul pus being present; there was also much external swelling of the neck, which, however, gradually subsided after removal of the bone.

Plate I. is a fairly typical radiograph made by Mr Holland in one of these cases. The foreign body was a portion of a sheep's skull, and is illustrated in No. 8 of text figure. The radiograph was taken by the flash method immediately after the patient had swallowed a mouthful of "food." It shows the "blob" held up by the bone, and the rest of the "food" on its way to the stomach.

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in such circumstances very little force is sufficient to cause perforation of the wall. The œdematous swelling, moreover, which is often considerable, increases the difficulty in these cases by concealing small spicules of bone; and thus overriding or pushing down by the end of the œsophagoscope of a fold of mucous membrane, so as to cover the object of one's search, is especially prone to occur, and is best avoided by employing a tube of moderate size.

### **Note on the X-Ray Diagnosis by C. Thurstan Holland, Ch.M.**

From the point of view of X-ray diagnosis the question of non-opaque foreign bodies arrested in the œsophagus is of great interest. Experience extending over many years has led to the establishment of a definite technique and to a definite line of action. It may be taken that by far the larger number of cases are those in which a bone (from fish or meat) is supposed to have been swallowed, but more occasionally other non-opaque bodies, not necessarily associated with food, are found.

The method of examination which we use as a routine in such suspected cases is as follows:—

(1) The patient, stripped to the waist, is examined in the standing position, and a careful search of the whole œsophagus is made on the fluorescent screen.

It is necessary that the diaphragm in front of the tube allows of a small, slit-like area of illumination on the screen.

All the oblique positions are used as required, but that generally found most useful by us is with the patient tilted with the left back to the screen.

Theoretically, pieces of bone, etc., should not be termed non-opaque to X-rays, but from a practical point of view they are seldom seen on a screen or plate examination: and the term non-opaque is meant to cover all those cases in which the foreign body is not seen on the screen.

(2) The next proceeding is that, still with the left back to the screen, a mouthful of bread and milk and barium of the consistence of *thick* bread sauce is given to the patient. This is swallowed and its course down the œsophagus watched.

(a) If two or three such large mouthfuls enter and pass down the œsophagus perfectly normally, then it is assumed that in all probability no foreign body is present. This is reported, but the patient is warned to report again should any symptoms persist.

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(b) If a foreign body is actually present, then, in a typical case, the food will pass down normally to its site. In certain circumstances it may be practically totally arrested by the foreign body, and may be regurgitated. In others, the greater part may, after a temporary hitch, pass on into the stomach, leaving a small bit arrested by the foreign body. If this observation is repeated with each mouthful then it is assumed that in fact a foreign body is present.

(c) Further, should a temporary hitch, without any definite hold up or bit left behind, occur on repeated examination, this fact is viewed with grave suspicion and reported. Indeed, any slight departure from the normal passage of the test bolus should never be overlooked in cases which complain of something sticking in the throat and causing difficulty or pain in swallowing.

(d) In a few cases a definite diagnosis can be made in which there is no hitch, etc., of the food. For instance, I have seen a case in which the food passed apparently perfectly normally with no hitch, temporary or otherwise, and with no residue. In this case, however, in one position it could be seen that at a fixed spot in the Œsophagus the food shadow divided into two halves which almost immediately rejoined and passed straight down into the Œsophagus. It was impossible to get a record of this on a plate, but on the screen it could be seen with ease.

A flat bone on edge was afterwards removed from the spot indicated.

# OPERATIVE PROCEDURES IN THE TREATMENT OF STENOSIS OF THE LARYNX CAUSED BY BILATERAL PARALYSIS OF THE ABDUCTOR MUSCLES.

*With Special Reference to a New Method by means of which the Airway  
may be Permanently Enlarged, and the Patient Decannulated.\**

By IRWIN MOORE, M.Ch.

## I. Introduction.

IN this communication I wish to mention the various operative procedures which have been suggested in the past for the permanent relief of laryngeal stenosis caused by bilateral abductor paralysis, and to bring to notice some preliminary investigations which I have been carrying out.

Professor Hobday recently suggested the possibility of permanently reopening the airway in cases of double abductor paralysis by ventriculectomy as performed in the horse for unilateral recurrent paralysis (roaring). This suggestion has set me thinking that perhaps we are lacking in our endeavours in not trying to do something more than tracheotomy for those unfortunate people who are suffering from this distressing condition. Tracheotomy is only a life-saving device, and leaves the patient in a position of prolonged dependence upon a cannula. Have we, then, at the present day, any satisfactory method by means of which, in cases of double abductor paralysis, the airway may be re-opened, and the respiration restored through the natural passages?

We know that the adductor and abductor muscles of the vocal cords are supplied by the inferior laryngeal nerves, and that any destructive lesion of the nerve or its centre in the medulla produces its effect by paralysing first the abductor muscles, and finally the adductors. In double abductor paralysis it is the unopposed action of the crico-arytenoideus lateralis, along with paralysis of the crico-arytænoideus posticus and the thyro-arytænoideus which draws the cords into the airway of the larynx, and causes the stenosis. The cords become flaccid, and will not separate, and their edges flap up and down. The

\* Communication to the Section of Laryngology, Royal Society of Medicine, February 1923.

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complete stage of paralysis of the recurrent nerves, *i.e.*, the cords lying in the cadaveric position, usually allows of a sufficient airway, and prevents urgent dyspnoea, and the necessity of tracheotomy.

Amongst the various causes, bulbar lesions are the most common. In 90 per cent. of the cases they are tabetic in origin. Of fifty-three cases of abductor paralysis recorded between 1892 and 1898 only six developed complete recurrent paralysis. Of the balance, twenty-two had unilateral, and twenty-five bilateral abductor paralysis. These statistics show how small is the chance of cases of double abductor ever reaching the stage of complete paralysis, *i.e.*, with the cords in the cadaveric position.

## II. Operative Treatment.

It is said that operative treatment for opening the airway is contraindicated in the first six months, since occasionally spontaneous recovery may occur. Chevalier Jackson thinks it better to wait for a year, as recovery after that time is probably impossible. After waiting so long, however, certain operative procedures are rendered useless owing to contraction and atrophy of the thyro-arytænoideus muscle, or to fixation of the crico-arytænoid joint.

(1) **Simple Division of the Recurrent Nerves.**—This has been carried out with the idea of placing the cords in the cadaveric position and thus relieving the stenosis, but the results have been very disappointing. Chevalier Jackson has operated by this method in one case, but he considers that the operation has been a failure. This is probably due to shortening of the adductors which results from long contraction without antagonism, so that the vocal cord still keeps a median position.

(2) **Re-establishment of Nerve Continuity by Resection and Anastomosis.**—(a) Without transplantation. (b) With transplantation, *e.g.*, the recurrent with the pneumogastric nerve. Its use is limited to recent cases of peripheral cervical lesions, *e.g.*, following thyroidectomy.

(3) **Corpectomy, i.e., Excision of the Vocal Cord only.**—This has been carried out by (a) the indirect method with the laryngoscopic mirror, or directly with Kirstein's autoscope; (b) thyrofissure.

The results have not been successful on account of the

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excessive granulations which follow the operation, necessitating re-insertion of the tracheotomy tube.

(4) **Arytænoidectomy.**—Since the arytænoids are the cartilages on which the vocal cords move, it was natural that they should receive the attention of operators. From 1834 to 1905, arytænoidectomy was employed by veterinary surgeons upon horses for the relief of laryngeal stridor ("roaring"), due to paralysis of the left vocal cord. Ivanoff, in 1911, first performed this operation in man in a tracheotomised syphilitic patient whose cords were abducted. He carried out a unilateral arytænoidectomy, but later the cord became loosened, and respiration was impeded, thus necessitating its partial removal. The results were unsatisfactory, also, in a few other cases recorded.

(5) **Ventriculectomy or "Stripping" of the Lining Membrane of the Ventricle.**—In 1906, Williams (Cornell University, U.S.A.), finding that removal of the cords and their muscles in the horse predisposed to recurrence of stenosis, originated *per se* excision of the lining membrane of the ventricle. The operation consists in excision of the everted ventricular mucosa, putting out of action the adductor power of the vocal cords, which become attached by cicatricial contraction to the lateral wall of the larynx, in the position of forced abduction. Since 1906, veterinary surgeons have found ventriculectomy a better operation than arytænoidectomy in cases of recurrent nerve paralysis.

Hobday, in 1910, considerably improved the operation by entering the larynx through the crico-thyroid membrane, and stripping both ventricles at the same time. Sargnon and Troubert, collaborating in a paper published in 1914, suggested that ventriculectomy should yield the same favourable results in the human subject as in veterinary practice, and came to the conclusion that, whilst it was easy to perform in the horse because the operator is able to introduce the end of his index finger into the ventricle, it was very difficult to perform in man, even on a cadaver, and that the only applicable method in the human subject was by scraping and curettage of the membrane. Professor Hobday has recently suggested (1921) that ventriculectomy, as performed in the horse, might be applicable in man in cases of double abductor paralysis.

Vlasto (1921) has contrasted the anatomical difference between the ventricle and the sacculus in the horse and in

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man, pointing out that in the horse the ventricle and sacculus form one large cavity, extending downwards below the vocal cord and lining its outer surface; that its attachments are extremely loose, and can be easily stripped off in one piece, leaving raw surfaces opposed to one another, which adhere, and so cause a lateral retraction of the vocal cord. But in man the ventricle is very difficult to evert in the same manner. Therefore he does not think the operation is practicable or possible in the human subject.

Monnelles (Florence), in 1900, attempted to reproduce the condition of eversion of the ventricle artificially in thirty-three cases in the human subject after death, without success; in every case the superficial layers of the mucosa instead of the whole thickness of the mucous membrane was torn in attempting to draw out the lining membrane of the ventricles. Piersol has pointed out that in man the upper surface of the true cord slants only slightly downwards and outwards. The question whether the superior and outer surface of the cord, if stripped of its membrane, is of sufficient extent to adhere to the raw surface of the lateral wall of the ventricle, and so cause lateral retraction of the cord, is doubtful.

I have found, by operating on the cadaver, that the ventricle and sacculus cannot be everted and removed by the same method as in the horse, as described by Professor Hobday: in every case the forceps tore through the mucosa. It is possible, however, by dissection, to detach and remove the ventricular lining in one piece, if, after complete detachment, it is excised at its anterior attachment to the mouth of the sacculus, the latter being left *in situ*.

It is very difficult to detach the sacculus, either along with the ventricle or even after removal of the ventricle, on account of the firm attachment of the suspensory ligament of Hilton, which slings up and supports the sacculus. Again, the mucous membrane covering the inner surface of the sacculus is very thin, and is so firmly adherent to the saccular wall, that it readily tears during attempts at separation. In only one out of eight attempts have I been able to remove the sacculus along with the ventricle.

If removal of the ventricular wall is ever attempted for treating abductor paralysis in man, it will probably be found advisable to remove only the ventricular lining, the sacculus being left undisturbed to carry on its normal function of secreting

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mucus. With regard to adhesion of the rawed surface of the vocal cord to that of the lateral wall of the ventricle, I suggest that temporary fixation of the vocal cord to the lateral wall by means of a suture passed through the vocal cord and thyroid ala and tied externally, might encourage permanent adhesion and retraction.

(6) **Evisceration or Ablation of the Vocal Cord and the soft parts lining the Larynx.**—This operation may be carried out endoscopically or by thyro-fissure. Chevalier Jackson has had one successful endoscopic case. He states that he has found "evisceration" by thyro-fissure ideal in cases in which no other lesion is present beyond the actual bilateral paralysis, but considers that endoscopic evisceration is preferable. Two patients upon whom he operated by the latter method, were permanently decannulated, and had fairly loud voices. In both these cases all the soft tissue of the cord (and not simply the cord), including the subglottic tissue, was removed by dissection on both sides, leaving the perichondrium intact. Both were able to dispense with their tracheotomy tube.

(7) **Ventriculo-cordectomy.**—This operation, introduced by Chevalier Jackson, may be carried out either endoscopically or by thyro-fissure, and consists in excision by punch forceps of the vocal cord along with its supporting tissue forming the *floor of the ventricle*. Chevalier Jackson has performed the operation endoscopically in eighteen cases under cocaine anæsthesia without any operative mortality. In eleven cases the operation failed to re-open the airway, on account of complications, *e.g.*, cicatricial stenosis, and other means had to be employed. In the remaining seven cases, the patients were relieved of dyspnœa.

Molinié (Marseilles), in 1913, first considered the possibility of deviating the paralysed vocal cords laterally from the middle line, by displacing their anterior attachments inwards, *i.e.*, antero-posteriorly. He first operated upon the cadaver by an incision through the midline of the thyroid cartilage without opening the cavity of the larynx, *i.e.*, he did not incise the internal perichondrium. Two similar lateral incisions were next made on each side 5 mm. from the middle line incision, leaving two loose lateral pieces of cartilage (attached to perichondrium) which could be pressed inwards towards the centre of the larynx and kept in position by a steel band, thus



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diminishing the antero-posterior diameter of the laryngeal box, and causing deviation of the cords towards the lateral wall of the larynx. By this means (in the cadaver) an ovoid glottis was obtained. Molinié, thinking that the same results would follow in the living, performed a similar operation on a male patient, aged 25, suffering from bilateral abductor paralysis. The operation was a failure, and a tracheotomy tube had to be reinserted.

**(8) Cordopexy,\* or Antero-lateral transplantation of the Vocal Cord.**—Wilfred Trotter recently (1922) suggested a very ingenious method of dealing with cases of abductor paralysis, by means of which he considered it might be possible to re-open the obstructed airway by transferring one or both of the paralysed cords from the middle line to the lateral wall of the larynx. He proposed that an incision should be made transversely across the middle of the thyroid cartilage, a retractor inserted, and the larynx opened so as to obtain a good view of the anterior insertion of the vocal cords. When this had been located, the portion of cartilage to which the cords are attached could be separated from the thyroid ala by a circular incision, drawn forwards and carried laterally along the transverse incision through the thyroid ala. On removal of the retractor, the separated halves of the thyroid cartilage would come together and fix the cords in their new position. Much impressed with this idea, I obtained permission from Mr Trotter to carry out investigations and ascertain its possibilities. Following out these suggestions on the cadaver I found that the approach to the larynx by a transverse incision was not satisfactory, because it is impossible to locate accurately—from the exterior of the larynx—the anterior insertions of the vocal cords, which are only separated from those of the false cords by a distance of 2.5 mm.

Later, the possibility presented itself of locating the point of origin of the vocal cords from the outside, and reaching them through a small incision in the middle line of the thyroid cartilage.

**Point of Origin of the Vocal Cords.**—Piersol, in his text-book of Anatomy, has pointed out that the true vocal cords arise, in both sexes, a little above the middle of a line extending from the bottom of the thyroid notch to the lower border of the

\* *Postscript.*—To this operation I have—since the Meeting—given the name “Cordopexy.”

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thyroid cartilage. The anatomical studies of Taguchi showed that the average distance, in men, from the notch to the vocal cord was 8.5 mm. and from the lower border of the thyroid cartilage 10.5 mm. In women these distances were 6.5 and 8 mm. respectively, and the distance between the true vocal cords at their origin was 1.5 mm. in both sexes. The false vocal cords arose about 2.5 mm. above the true ones, and were, on the average, 4 mm. apart from each other.

The apparent accuracy of these landmarks suggested to me the possibility of ascertaining the anterior insertion of the cords from the outside of the larynx. After careful measurement, an incision a quarter of an inch in length was made through the centre of the middle line of the thyroid cartilage, and a bent probe inserted so as to locate the point of attachment of the cords. Next, a piece of cartilage (forming a triangle with the previous incision) was excised, to which (it was concluded) the anterior extremity of the cord was attached. From the apex of the triangle another incision was carried laterally through the thyroid ala for a quarter of an inch. The separated triangular piece of cartilage (with presumably the attached cord) was then drawn forwards and carried laterally between the cut halves of the thyroid ala. The apparently complete detachment of the cord, together with the ease with which it could be transferred laterally, was specially noticed. When the larynx was opened in the middle line, it was found that it was the ventricular band which had been transferred, not the true cord, thus showing that accuracy in defining the true cord could not be assured in this manner. Later investigations confirmed the fact that, owing to the varying position (calculated by outside measurement) of the true cords in relation to the centre of the thyroid cartilage, accuracy in location could only be attained by first performing a thyro-fissure.

At the next attempt, thyro-fissure was first performed, a triangular piece of cartilage excised (along with the attached cord) when it was found that the anterior end of the true cord was not as free as in the previous case, and could not be transferred laterally on account of the attachment of the perichondrium and muscular fibres of the thyro-arytænoideus. Elevation of the periosteum in the vicinity released the cord and permitted the piece of cartilage, with the attached cord, to be easily drawn along the horizontal incision and anchored.

Professor Shattock, to whom I am indebted for co-operating

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with me and for giving me the opportunity of carrying out these investigations, pointed out that strangulation of the tissues of the cord might ensue owing to their being tightly gripped by the cut edges of the cartilage. To avoid this, a small half-circular piece of cartilage was punched out of each half of the cartilage, forming a circular opening in which the cord could lie. In another case, in which the ala was ossified, widening the horizontal incision by cutting out a piece with bone forceps removed the constriction of the cord.

By means of this operation the vocal cord or cords may not only be displaced laterally, but also shortened in their antero-posterior diameter, thus increasing the tonicity of the paralysed cord tissues. Transferring a vocal cord one quarter of an inch from the middle line was found to be sufficient to fix it in the position of complete abduction.

## III. The Voice following Operative Procedures.

Referring to the voice following evisceration or ablation of the soft parts lining the laryngeal box, Chevalier Jackson says that formerly it was believed that permanent loss of voice followed excision of the cord, but in two patients upon whom he operated a fairly loud voice resulted, though very rough and mostly in a monotone. Though a useful voice, it did not compare with the flexibility after thyro-fissure, in which there is unimpaired mobility of the arytaenoid joint.

Chevalier Jackson also says that in all the seven successful cases of ventriculo-cordectomy which he performed, the voice was "louder than an ordinary whisper, and loud enough to carry on an ordinary conversation in a reasonably quiet room."

Again, he says the whispered voice, or stage whisper for which no cord is necessary, will never be lost so long as the respiratory air passes through the larynx, and it may be fairly loud, though rough and inflexible.

## IV. Conclusions.

If we now have an operative procedure by means of which a permanent cure of stenosis in cases of double abductor paralysis can be guaranteed, the natural airway re-opened, and the patient decannulated, should we not carry this out during the early stage of the paralysis, even at the expense of some impairment of the voice, rather than await the uncertain

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occurrence of the complete stage of paresis, when the vocal cords may, or may not, assume the recurrent cadaveric position?

Disappearance of the paralysis in bilateral abductor paralysis is an extremely rare occurrence, though it has been reported in a case due to syphilis, and in a few other cases referred to by Chevalier Jackson. Gleitsmann (New York) says there is only one case known of recovery from bilateral recurrent paralysis.

How many cases of double abductor paralysis have been observed, in which all the motor fibres have been destroyed, and in which the cadaveric position of the cords has been reached; how many cases, having reached this stage, resume the primary position with the cords in the middle line, which Semon has pointed out may occur later if the adductor muscles recover their tone?

In cases of double abductor paralysis we have to deal with a very small glottic chink, which is closed more completely on inspiration. The expiration is free, but with strong inspiratory dyspnœa. The voice is normal, or nearly so, but accompanied by a stridulous noise. It is only in the later stage, when the adductor muscles are affected, that the voice is much altered.

## THE TREATMENT OF CHRONIC MIDDLE-EAR SUPPURATION BY ELECTRIC IONISATION.

By STEPHEN YOUNG, M.B., Ch.B., Surgeon for Diseases of the Throat, Nose, and Ear to the Out-patient Department of the Glasgow Royal Infirmary, (late) Senior Clinical Assistant Ear and Throat Department, Edinburgh Royal Infirmary.

THE investigation was carried out at the Ear and Throat Clinic of the Royal Infirmary, Edinburgh, under the control of Dr A. Logan Turner, and the writer is indebted to Dr Logan Turner and Dr J. S. Fraser for many helpful suggestions as to the lines of the investigation, and for permission to treat their patients.

The literature on this subject is naturally rather scanty, but in several contributions statistics are given which, I think, require careful analysis, if one is to obtain a clear idea of the place to be taken by Electric Ionisation in the treatment of Chronic Middle-Ear Suppuration.

I have attempted to find out :—

- (a) Whether ionisation might occupy a middle place between the ordinary conservative treatment of middle-ear suppuration and the various mastoid operations.
- (b) To ascertain, if possible, the types of cases likely to respond to this method of treatment; and
- (c) The possible contra-indications for its use.

Wells, in an article published in the *Lancet* of December 1921, gives two series of cases of middle-ear suppuration treated by ionisation, and claims 60 per cent. of cures of the suppurative process. It is not stated, however, whether a previous efficient course of conservative treatment was tried in these cases.

There are also two interesting contributions from Friel, one in the *Lancet* of August 1920, and the other in the *British Medical Journal* of August 1922. In the first he claims 54 cures out of 99 cases treated, and gives in some detail the report of 11 cases from his 54 cures.

An analysis of the 11 cases is interesting. In 5 cases no report is given after four to fourteen days, and 6 cases are reported as dry after one month. It has been my experience

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that cases may be perfectly dry up to fourteen days, and yet, after three weeks, may be discharging freely as before.

In the second series he claims 131 cures out of 264 cases. I think that at least fourteen days must elapse before one can claim a cure of the suppurative process. A recurrence of the discharge after three to four weeks is possibly due to some reinfection.

Most otologists, I think, will agree that at least 50 per cent. of all cases of chronic middle-ear suppuration clear up with efficient conservative treatment. Hence, to introduce ionisation as a treatment for this 50 per cent. of cases is to employ a laborious and somewhat tedious treatment for cases which do not require it.

What I have attempted to find out is what percentage of the remaining 50 per cent. of cases, which fail to clear up with conservative measures, will respond to ionisation and thus prevent the necessity of a mastoid operation.

**Apparatus and Technique.**—The method of treatment I have used was based largely on Dr Friel's suggestions for treating cases of middle-ear suppuration. By the use of electric ionisation we get a much more concentrated application of our antiseptic to the suppurating cavity. Only cases which had at least one month's efficient conservative treatment before ionisation are included in this series of cases. The current used was obtained from the main. The lowering of the voltage and the regulation of the current were obtained by passing the latter through two resistances—one being a lamp in one of the wires leading from the main, and the other a shunt resistance made of wire wrapped on a slate core. A milliamperemeter which measured the current he received was inserted in the same circuit as the patient.

A vulcanite aural speculum is required, fitted with a special terminal of its own. A fine wire runs down the inside of the speculum from the terminal almost to its tip. The solution used was made up of:—Zinc sulphate, 75 grains; glycerine, 2 oz.; water to 35 oz.; and was diluted at the time of using with an equal quantity of warm water.

The affected ear was first syringed free of pus and debris, and the position and size of the perforation ascertained. The ear was then syringed twice with the zinc solution.

The patient then lay down on a trolley with the affected ear uppermost. The meatus was filled with the zinc solution, a

## Chronic Middle-Ear Suppuration

vulcanite Siegle's speculum inserted and the air bubbles removed as far as possible from the deeper parts of the meatus and the tympanic cavity. The special speculum, with the positive pole leading to its terminal, and with a wick of cotton-wool inserted, was introduced into the meatus and the ear filled as far as possible by the addition of zinc sulphate solution.

The negative electrode consisted of a broad zinc plate, well covered with lint to prevent burning, and soaked in saline solution. The negative electrode was applied to one or other forearm.

The current was increased *very gradually* until it reached 3-4 ma., where it was allowed to remain for eight to ten minutes and then gradually diminished. Sudden increase or diminution of the current must always be avoided. Apart from a little giddiness which soon passed off, no unusual symptoms followed any of the applications. If one treatment was not sufficient, about one week was allowed to elapse before any subsequent application was made.

The details of 25 Consecutive Cases treated are given in the table on pages 248-49.

It will be seen that, of the 25 cases treated, there were 14 cases of bilateral middle-ear suppuration in which both ears were ionised and 11 cases of unilateral suppuration, giving a total of 39 treated ears. Of these, 4 cases treated did not afterwards report, leaving 35 cases.

I think the results of treatment may be briefly stated thus:—

	Cases
Completely cured by ionisation . . . .	18
Considerably improved . . . .	5
Failures . . . .	12
Total . . . .	<u>35</u>

Although the numbers are too small from which to draw general conclusions, it would seem that of the 50 per cent. of cases of middle-ear suppuration failing to respond to conservative measures about half will be cured by efficient ionisation treatment, thus leaving about 25 per cent. of all cases of chronic middle-ear suppuration which will require mastoid operation or some other form of treatment.

If ionisation can cure anything like 50 per cent. of cases not responding to conservative treatment, I think its place in otology is assured.

An analysis of the above series of cases reveals some interesting facts.

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Number and Name.	Sex.	Age.	Duration of Discharge.	Duration of conservative Treatment.	Ionisation.	Result.	Remarks.	
1. W. C.	M.	19	1 year	2 months	L. ear (1) 17/1/22 (2) 22/2/22 (3) 19/3/23 R. ear 19/3/22	24/12/22. No discharge from either ear.	R.M.T. Large perforation. Favourable case large central perforations.	R.—C. L.—C.
2. A. C.	F.	9	8 years	8 months	L. ear (1) 18/1/22 " (2) 21/2/22 " (3) 28/3/22 R. ear (1) 23/1/22 " (2) 28/3/22	13/4/22. Discharge continues from both ears.	L.M.T. Postero-inferior perforation. Kidney-shaped perforation in lower part. Old case, apparently mastoid involvement.	R.—F. L.—F.
3. L. C.	M.	12	Measles 10 years ago	6 weeks	R. ear (1) 19/1/22 " (2) 30/1/22 " (3) 6/2/22 " (4) 28/3/22 L. ear 28/3/22	28/5/22. Combined with conservative treatment. Both ears dry.	Narrow auditory meatuses, with otitis requiring packing.	R.—I. L.—I.
4. N. D.	M.	10	7 years	2 months	L. ear (1) 21/1/22 " (2) 21/2/22 " (3) 13/3/22	5/6/22. L.M.T. No discharge. Having conservative treatment.	Treatment interfered with by recurrent furuncle of the meatus. Perforation high up in Shrapnell's region, filled with cholesteatoma.	L.—F.
5. A. P.	F.	8	6 years	? years	L. ear (1) 20/1/22	23/1/22. Profuse discharge.	Anterior perforation. Eustachian catarrh. No improvement with ionisation.	L.—F.
6. M. E.	F.	18	Childhood	2 months	L. ear (1) 23/1/22 " (2) 9/2/22 " (3) 16/3/22 R. ear (1) 16/2/22 " (2) 16/3/22	13/4/22. Both ears discharging.	L.M.T. Central perforation. Patient suffers from Hypertrophic Rhinitis. Ears remain dry until reinfected from the Eustachian tubes, following "Colds in the head."	R.—I. L.—I.
7. K. F.	F.	11	Since childhood	5 months	R. ear 25/1/22	10/3/22. R. ear absolutely dry.	No conservative treatment after ionisation. Central perforation.	R.—C.
8. J. F.	M.	23	4 or 5 yrs.	3 months	L. ear 31/1/22 R. ear 16/3/22	16/3/22. L.M.T. quite dry.	Large central perforation. In this case a submucous resection and turbinotomy were performed previous to ionisation.	L.—C. R.—C.
9. J. F.	M.	16	5 or 6 yrs.	2 months	R. ear (1) 7/2/22 " (2) 14/2/22 L. ear 20/3/22	20/3/22. R.M.T. free from discharge.	Large perforation; a complete cure of R. ear. No report on L. ear.	R.—C.
10. A. R.	F.	23	10 years	?	R. ear 9/2/22 L. ear 13/2/22	25/2/22. No discharge from either ear.	Patient very deaf. ? hearing slightly improved.	R.—C. L.—C.



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11. M. B.	M.	34	6 years	3 weeks	L. ear	10/2/22	18/2/22, Ear absolutely dry.	No marked improvement in hearing. Suppuration cured. Patient did not report again.	L.—C.
12. J. F.	F.	23	2 years	2 months	L. ear	10/2/22	...		
13. R. H.	M.	30	7 months	3 weeks	L. ear " (3) " (3)	(1) 13/2/22 (2) 16/2/22 (3) 8/3/22	L.M.T. absolutely dry.	In spite of ionisation a very slight discharge continued from left meatus. After resection of nasal septum discharge cleared up.	L.—L. After resection C.
14. K. G.	F.	46	...	2 months	L. ear "	(1) 17/2/22 (2) 21/3/22	L.M.T. with perforation quite free from discharge but there is still cholesteatoma material in region of outer attic wall.	L.M.T. Large central perforation. Also small opening with cholesteatoma in region of outer attic wall. Ionisation in this case revealed clearly the infected area, the tympanic cavity itself clearing up.	L.—F.
15. J. R.	M.	19	1½ years	1 month	L. ear R. ear	19/2/22 14/3/22	12/5/22, No discharge since ionisation.	No conservative treatment since ionisation. Central perforations showing pale mucosa of inner wall.	R.—C. L.—C.
16. J. W.	M.	35	Since act. 15	3 weeks	R. ear	(1) 23/2/22 (2) 2/3/22	10/3/22, Both tympanic cavities dry.	Pale inner wall of the tympanic cavity seen through the central perforation.	R.—C.
17. M. L.	F.	23	No history obtained	1 month	R. ear	(1) 23/2/22 (2) 17/3/22	No improvement.	Patient tubercular. Tubercular adenitis. Ozena of nose. Unsuitable case.	R.—F.
18. J. R.	M.	13	6 years	2 months	R. ear	2/3/22	19/3/22, Not improved.	After syringing R. ear small pink granulation growing down from attic perforation. Not suitable.	R.—F.
19. J. C.	M.	20	11 years	3 months	L. ear	14/3/22	19/5/22, Still profuse foul discharge.	Post. margin perforation; probably mastoid involvement.	L.—F.
20. M. K.	M.	15	4 months	6 weeks	R. ear	30/5/22	13/4/22, Still some discharge from both ears.	Post. marg. perforation; probable mastoid involvement.	R.—F. L.—F.
21. J. R.	M.	8	years	Several months	R. ear	28/3/22	...	Did not afterwards report.	
22. J. H.	F.	18	12 years	Repeated	L. ear R. ear L. ear	28/3/22 4/4/22 4/4/22	22/4/22, Both M.T.'s dry. Large perforation pale inner wall of tympanum.	Both with central perforations. Favourable case.	R.—C. L.—C.
23. E. T.	F.	20	Since childhood	1 year	R. ear	11/4/22	1/5/22, Both M.T.'s quite dry.	Large perforation (central).	R.—C. L.—C.
24. J. S.	F.	14	? 3 mths.	Several weeks	L. ear R. ear L. ear	12/4/22 12/4/22 12/4/22	20/4/22, Still some discharge.	Granulations growing through perforation in R.M.T. Ordinary methods of ionisation fail because of these in tympanic cavity.	R.—F. L.—F.
25. E. W. D.	F.	16	6 months	Several months	R. ear L. ear	17/5/22 19/5/22	6/6/22, Both ears free from discharge.	Inner wall still a little red. Suggest further ionisation.	R.—C. L.—C.

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Almost all the 18 cases which resulted in complete cure of the suppuration had fairly large central perforations with which one associates pure tympanic suppuration, and it was thus fairly easy to get the ionising fluid in contact with the whole suppurating area.

I have made an attempt to find out the cause of failure in the other patients. Thus 5 cases had posterior marginal perforations with foul-smelling discharge, probably associated with suppuration in the mastoid antrum and cells, and 3 cases had anterior marginal perforations with a catarrhal condition of the Eustachian tube. In 2 cases there was an attic perforation with cholesteatomatous material coming through it. One case improved considerably, but the patient had some degree of nasal obstruction due to a deflected septum. After submucous resection of the septum the ear dried up completely. One case suffered from ozæna and was being treated by tuberculin for tubercular adenitis.

In 4 cases the suppuration of the middle ear was associated with an otitis externa and a very narrow meatus so that conservative treatment of any sort was very difficult.

Among the contra-indications for ionisation I would place :—

- (1) *Posterior perforation with mastoid involvement.*—Cases in which there is a posterior marginal perforation with involvement of the mastoid antrum and cells are quite out of reach of the ionising fluid and thus are not influenced in the slightest by the treatment.
- (2) *Attic perforation with cholesteatoma.*
- (3) *Organised granulations in the tympanic cavity or mastoid antrum.*
- (4) *Nasopharyngeal conditions.*—It cannot be urged too strongly that where there is any nasopharyngeal suppuration or obstruction, this must be treated first or a reinfection will almost certainly occur.
- (5) *Anterior marginal perforations with Eustachian tube infection.*—I have found cases with anterior perforations and a catarrhal condition of the Eustachian tube particularly unsatisfactory, but I hope some method will be found of dealing also with the Eustachian tube.

The cases recorded above were not selected because I desired to find out which cases would respond to treatment and which would not.

## Chronic Middle-Ear Suppuration

In conclusion I would suggest that before ionising a suppurating ear one ought to be certain that—

- (1) The patient has had an efficient course of conservative treatment without effect.
- (2) That there is no nasopharyngeal condition which requires attention.
- (3) That there is no evidence of cholesteatoma or mastoid involvement.

I have no doubt that ionisation carried out by the aurist himself on properly selected cases will give successful results in cases of chronic suppurative otitis media and will form a valuable addition to our methods of treatment.

## CLINICAL RECORD

### TWO CASES OF INJURY TO THE EAR FOLLOWING ON OPERATION FOR ACUTE MASTOIDITIS.

By F. G. WRIGLEY, M.D., Hon. Surgeon Manchester Ear Hospital,  
Second Assistant Surgical Officer, Aural Department, Manchester  
Royal Infirmary.

CASE I.—A. V., male, aged 10 years, was seen by me in January 1921. There was a history of discharge from the left ear for three or four weeks. All the signs and symptoms of a typical acute mastoiditis were present, accompanied by marked œdema over the mastoid process. Schwartze's operation was performed. The antrum and cortical cells contained a large quantity of pus. As the perforation in the membrane was small, and as the membrane itself was bulging in the posterior segment, it was incised. The patient made an uneventful recovery, the middle ear being dry in ten days and the mastoid wound healed in six weeks. Three months later the tonsils and adenoids were removed, the ear still being dry. Ten months after the operation and prior to the boy's return to school, I again examined him and found the mastoid wound firmly healed, the tympanic membrane normal in appearance (except for a small scar) and the hearing normal.

Six weeks later the patient received a blow on the mastoid, and four days later an abscess formed over it. I reopened the wound and found the cavity filled with thin flaky pus, but there was no sign of any bone necrosis. There was no discharge from the ear and the tympanic membrane was intact. Up to the present there has been no sign of any recurrence of the trouble.

CASE II.—H. C., male, aged 8 years, was seen in hospital in March 1921, and on examination was found to be suffering from acute mastoiditis on the right side, with a large abscess behind the right ear. The ear had been discharging for about three weeks following an attack of influenza. A fistula was found in the mastoid cortex leading to the antrum, and the mastoid apex was filled with pus and septic granulation tissue. The tympanic membrane, which was bulging, was incised. Owing to the large size of the cavity the healing was delayed, and it was rather over ten weeks before the post-aural wound was fully healed, though the middle ear was dry and the perforation healed in a fortnight.

At the beginning of June 1922, the boy received a severe blow over the ear and mastoid, and a few days later he complained of pain in the ear and the right side of the head. He was first seen as an out-patient three weeks after the injury, when there was a

## Two Cases of Injury to the Ear

small perforation in the right membrane. Local treatment was instituted but was not very effective, the ear continuing to discharge, and a few weeks later an abscess formed over the mastoid. The wound was reopened and the cavity found to be full of pus and debris resembling cholesteatoma in character. The posterior meatal wall was diseased and accordingly the bridge was removed. A fistula was now seen in the external semi-circular canal, involving only the bony portion. This was not interfered with. The membrane and ossicles which had not been disturbed by the operation were left *in situ*.

For about two weeks, an evening temperature of 99 to 100 was the rule, with headache and some dizziness, but at the end of that time the symptoms subsided and the recovery was uneventful. The cavity became epithelialised in ten weeks after the operation.

The important point in these cases is to determine to what extent the injury was responsible for producing the second attack of mastoiditis. Both were cases in which the original disease was a true acute infection, and not an acute mastoiditis supervening on the top of a chronic middle-ear suppuration. Both cases again were under observation all the time the after-treatment was being carried out. The middle ear soon became dry, and the perforation healed. The hearing in the first case was normal during the whole period of the second attack. In the first, the mastoid had been healed for eleven months, and in the other case, for twelve months, and the recurrence in each followed a direct blow on the ear and mastoid, delivered with the open hand.

In operating on an infected mastoid it is not always easy to be certain that all the diseased cells have been thoroughly opened, but in the majority of cases any small cell that has been overlooked will clear up in the process of healing, if the posterior wound has been left open and drained. It seems a distinct possibility that a small focus of infection might remain in the mastoid without giving rise to any symptoms, and that this focus might receive enough impetus from a trauma to give rise to a recurrence of the suppuration.

The cases are also of interest from a medico-legal standpoint, as to how far the responsibility for the second illness and operation would lie with the agent causing the injury. If the second case had terminated fatally, as at one time seemed possible—the patient's condition a few days after operation rather suggested meningitis—it would have been a matter of great difficulty to settle the question one way or the other.

# SOCIETIES' PROCEEDINGS

## ROYAL SOCIETY OF MEDICINE—SECTION OF OTOLOGY

January 19, 1923.

*Acting President*—Sir CHARLES BALLANCE, K.C.M.G.,  
C.B., M.V.O., M.S.

*Chairman*—A. LOGAN TURNER, M.D.

**Labyrinthitis as a Complication of Middle-ear Suppuration**—A. LOGAN TURNER, M.D., and J. S. FRASER, M.B.—(The paper will be published *in extenso* in a future number of the *Journal of Laryngology and Otology*.)

**Complete Nerve-deafness due to Syphilis of Internal Ears; Caloric and Rotation Tests Negative, Galvanic Positive**—Sir JAMES DUNDAS-GRANT, K.B.E., M.D.—Patient, female, aged 21. Deaf eleven years. Stigmata pronounced. Tests indicate lesion of labyrinth without involvement of nerve-trunk.

Sir JAMES DUNDAS-GRANT said the indication was that the nerve endings in the labyrinth were destroyed by the disease, but the nerve itself was sound, and responded to galvanism.

Mr J. F. O'MALLEY said that the case was very interesting considered from the point of view of the development of the vestibular and cochlear nerves, because they developed in the same way as a posterior root nerve, so that when the disease was confined to the labyrinth, the cochlear ganglion was likely to suffer total extinction, whilst the vestibular ganglion, which lay in the internal auditory meatus, might escape, although its terminations in the labyrinth were destroyed.

**Otitis Media with Facial Palsy, following Scarlet Fever; Specimens (Malleus and Incus) shown**—F. J. CLEMINSON, F.R.C.S.—Child, aged 2 years and 10 months, was seen on 8th September 1922, with discharge from the left ear, and an incomplete left facial palsy. The history given by the mother was as follows:—Up to 25th April the child was well and had normal hearing so far as the parents could say. On that day she was admitted to an isolation hospital for scarlet fever. While there, she developed "measles and diphtheria of the nose." She was discharged one week before her visit. The facial weakness was said to be improving. The patient had her left ear syringed by a nurse, who washed out a perfectly macerated malleus and incus, without any sign of caries.

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The patient is apparently totally deaf, even the loudest sounds failing to attract her attention. While under observation the condition of the lower face (especially that of the muscles which retract the angle of the mouth) has improved very noticeably.

Mr CLEMINSON said he showed the case because it was known that rapid destruction of bone might take place in cases of scarlet fever, but he had never before seen a case in which the ligaments dissolved without affecting the integrity of the bones. The child, when admitted to the Fever Hospital, could hear and talk, but was now a deaf mute. After she had been shown at the November meeting she was found to be carrying the infection of scarlet fever, and the opposite ear, being in a state of chronic purulent inflammation, had therefore been subjected to a radical mastoid operation, and had become dry. Since then there had been no further suspicion of "carrying." The facial palsy was still showing a slow improvement.

Mr J. S. FRASER asked what was the opinion of members as to paralysis of the face being an indication for operation in acute otitis media. Text-books said that it constituted a reason for the performance of a Schwartze operation. Did members uphold that teaching, or did they believe that if there was no other indication for operation, such as pain, temperature or swelling, the mastoid should be left unopened, in anticipation that the facial paralysis would clear up?

Mr H. J. BANKS-DAVIS said he did not think the facial paralysis did clear up easily in those cases. He was impressed by two cases in particular. One was that of a nurse, who had had acute otitis media, with no symptoms except a slight pain in the ear. Her face was paralysed, the paralysis having come on within three days. He thought it better to do nothing, but the facial paralysis became rapidly worse, and reaction of degeneration was distinctly present. He then opened the mastoid antrum, and the condition cleared up, but only very slowly. Facial paralysis was liable to continue for a long time, and he thought the mastoid should be opened, as there might be something pressing on the nerve. The other woman to whom he referred had had her facial paralysis two years before recovery under electrical treatment; yet both of these cases were apparently identical.

Mr M. W. MOLLISON said he remembered two cases of acute otitis media with facial paralysis, in which free incision of the membrane cured the paralysis in a few days: one, a child, in three days; one, an adult, in ten days. He did not regard facial paralysis in otitis media as an indication to open the mastoid. If the acute otitis media had been present some days and the paralysis then developed, the case would be different. In the two cases he had mentioned, the facial paralysis developed almost simultaneously with the otitis. He believed increased pressure of fluid in the tympanum was communicated to the nerve through one of the dehiscences of the Fallopian canal.

Mr SYDNEY SCOTT (in reply to Mr Fraser's question) said that, in principle, he would be more inclined to open the mastoid if facial paralysis set in, in association with otitis media. The class of case being discussed

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was that in which acute otitis media developed, and the patient sooner or later had facial paralysis. He regarded that as an indication for extra free drainage.

Dr LOGAN TURNER said his experience agreed with that of Mr Mollison. Facial paralysis would clear up without operation. Two cases were recorded in the *Journal of Laryngology* last year in which the paralysis disappeared without interference.

Mr JENKINS.—Is not the one in a hundred the important one, rather than the majority?

Sir JAMES DUNDAS-GRANT doubted if in every case of Bell's paralysis the condition was due to inflammation in the middle ear. In Mr Mollison's case the membrane had not yet ruptured, but he presumed there were all the other signs of acute suppuration of the middle ear with bulging and redness, and in the presence of these he agreed with Mr Mollison's line of action, namely, to open the tympanum freely; if the paralysis did not then speedily subside, to do a Schwartze operation.

Mr CLEMINSON (in reply) said that the facial palsy was first noticed six weeks after the onset of the otorrhœa.

**Vertigo with Fixation of the Ossicles cured by Ossiculectomy**—Sir JAMES DUNDAS-GRANT, K.B.E., M.D.—Male, aged 24, suffered from frequent attacks of giddiness, so severe as to make him fall down. He had chronic suppuration in the left ear, which was satisfactorily dealt with by a modified mastoid operation, but the vertiginous attacks persisted and it was found that they were excited by the slightest pressure on the *right* tragus. The right malleus was found to be absolutely tied down to the promontory by cicatricial adhesions. After the removal of the ossicles the vertigo disappeared almost entirely, and it could no longer be induced by pressure on the tragus.

The explanation of the relief is probably that the malleus fixation rendered the incus and stapes immobile, and that the pressure of air, when the tragus was pushed in, acted upon the membrane of the round window with an abnormal degree of disturbance of the internal ear, owing to the loss of the safety-valve action of the stapes in the fenestra ovalis.

The hearing power for the whisper on the right side had improved from 5 ft. (before) up to 20 ft. (after the operation).

**Parotid Fistula following Mastoid Operations**—NORMAN PATTERSON, F.R.C.S.—Girl, aged 12, with right otorrhœa off and on since infancy. Seen 19th September 1921. History of severe pain. Purulent discharge in right ear; redness and bulging of posterior meatal wall; posterior perforation; tenderness over mastoid. Temperature 100.5° F., pulse 120, respiration 24. Operation same day. Complete mastoidectomy, bone cellular, cholesteatoma in middle ear, lateral sinus exposed and appeared healthy. 21st September: temperature



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103° F., pulse 120. Wound opened up. Decomposing blood clot and sloughs removed. Lateral sinus examined, but looked healthy. On 26th November the temperature, which had fallen to normal, rose to 102° F. Anaesthetic given; more sloughs removed; the lateral sinus was found to contain a parietal clot. The operation was completed by ligaturing the internal jugular vein. Examination of cerebro-spinal fluid obtained by lumbar puncture negative. Blood culture grew a hæmolytic streptococcus. For a week temperature swinging, up to 104° F. Temperature slowly came down to normal, and patient was sent to convalescent home on 28th November.

On 1st February 1922 swelling noticed in operation scar. It burst, and the discharge, which persisted, was at first blood-stained, then clear. It was not at this time realised that it came from the parotid.

22nd May 1922: wound opened and curetted. It was discovered that the sinus did not lead into the mastoid cavity.

Present condition: middle ear healed. Depressed scar over mastoid with very small opening from which saliva persistently drains. The flow is increased by getting the patient to chew something, such as a sweet. The fluid has been examined by Dr Panton, who reports that diastase is present in large amount. It is proposed to cauterise the fistula.

Mr H. J. BANKS-DAVIS said that four years ago he showed a man, aged 50, with parotid fistula, who came to the casualty department with "earache," and developed a small abscess at the tip of the mastoid. It was opened by the house surgeon, and a clear salivary discharge developed from the minute scar in the neck. Healing was very slow. He tried cauterising it, and eventually it was cured by ionisation. Cauterising might make the sinus larger, and he would suggest ionisation with a metal probe in the sinus.

Mr NORMAN PATTERSON (in reply) said that he brought the case as a curiosity, and in order to elicit suggestions as to treatment. He had intended to cauterise the fistula, but he delayed that procedure until he had shown the case to the Section. If cauterisation did not prove successful, he would try ionisation, and report the result.

**Ossification of Incus to Tegmen**—SYDNEY SCOTT, M.S.—The specimen is from a case of radical mastoid operation for cholesteatoma; bony ankylosis of the body of the incus to the tegmen was discovered.

In the case of cholesteatoma there is usually no trace of the incus. In the specimen shown, the incus was perfect except where the body and posterior limb were fixed to the tegmen by a mass of new bone. The patient was very deaf, as one would expect, with bony ankylosis.

**Acquired Atresia of the Auditory Meatus**—E. LOWRY, M.B.—Female, aged 32, has been complaining of deafness in the left ear for the last two years. Three and a half years ago she had a lower

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left molar extracted, after which she first noticed discharge from the left ear which lasted for four weeks. There is no history of any previous illness.

Present condition: Right ear normal. Left ear completely deaf as regards air conduction. Rinne negative. The meatus is completely closed by a fibrous membrane close to the surface. Case is shown in order to obtain advice as to operative treatment.

**Vertigo (simulating "Menière's Disease") with Anomalous Nystagmus Reactions**—Sir JAMES DUNDAS-GRANT, K.B.E., M.D.—Female, aged 35, first seen in November 1922, complaining of frequent attacks of vertigo with vomiting, the first attack having come on suddenly about a year previously. There was deafness of the right ear, the bone conduction was diminished, and the hearing for Galton's whistle did not extend above the mark 3.4. There was spontaneous nystagmus, which, instead of being to the side opposite to the apparent lesion, was towards the same side, and there was marked falling to the opposite side. A simple labyrinthine lesion would not produce this. The caloric (cold air) and rotation tests produced normal nystagmus, but to a lesser degree on the right than on the left side; there was complete absence of past-pointing to either side, and the falling was invariably towards the sound side, whichever ear was acted upon. Wassermann reaction negative. Perhaps a neurological examination will suggest a lesion in the superior cerebellar peduncle. The result will be reported at the next meeting.

## SECTION OF LARYNGOLOGY

February 2, 1923.

*President*—Mr CHARLES A. PARKER, F.R.C.S.Ed.

**Œdema of the Septum in association with Nasal Polypi**—A. J. WRIGHT, F.R.C.S.—Male, aged 60, with nasal discharge and obstruction for ten years. Polypi removed on many occasions, and intranasal operations on antra and ethmoidal cells. In April 1920 limited submucous resection. Since then, slowly increasing swelling of septum. Suggestions as to treatment are invited. Would removal of the septum be justifiable and helpful?

Dr W. HILL suggested that a piece be cut out, extending, if necessary, through the whole thickness of the mucosa to ascertain whether it was lymphangitis of exceptional form, or a solid pseudo-œdema.

Sir WILLIAM MILLIGAN said he understood that the swelling had been punctured, but no fluid was present. He had the impression that the

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condition was a very low form of perichondrial infection, dating from the operation. He did not advise removal of any portion of the septum. He suggested that diathermy with a very fine needle would not only sterilise it, but also cause sufficient cicatricial contraction to bring the two sides of the potential cavity together, and make a fairly rigid septum.

Mr W. STUART-LOW said he had had a similar case, but less severe. The patient was employed at dusty work, and this patient also worked in grain dust, which was sometimes very irritating. He (the speaker) preferred oily preparations to lotions, since they supplied better protection from the dust. In the present case a discharge was seen in the upper part of the nasal cavities, and he asked whether it contained streptococci, as these organisms were very irritating to the mucous membrane and might help to explain the condition. In his own case, he first improved the patient's general health, and employed oily applications. Later he incised the swelling freely and packed the nasal cavity with strips of gauze soaked in liquid iodex, and under this treatment the swelling rapidly subsided and did not recur.

Dr SYME agreed that it was a case of septic œdema due to disease of the ethmoids and antral cavities, which were discharging freely. He advised opening the maxillary antra by the canine fossa route, and removal of the diseased ethmoid plate.

Dr DAN M'KENZIE remarked that he had had a number of similar cases, and had found a difficulty in explaining why the œdema should be most strongly marked at the bony part of the septum, the cartilaginous part being not so much involved. It was always associated with sepsis of the ethmoid, and in the cases he had seen the condition improved to a moderate extent after the ethmoids had been thoroughly removed.

Dr SMURTHWAITE said he had had a similar experience after septum resection. He incised the swelling and found a big cavity with septic serum inside, which he curetted, this being followed by the treatment mentioned by Mr Stuart-Low, and in a week the surfaces united. Union did not occur at first, as there was a cavity filled with blood, which became septic. He advised this treatment, following the removal of unhealthy ethmoids.

Mr M. VLASTO said that palpation with the little fingers in each nostril showed that the swelling was not so marked as it appeared to be on inspection. The fingers were arrested by a distinct vomerine ridge, the removal of which by a more complete resection would probably get rid of some of the obstruction.

Mr SOMERVILLE HASTINGS said he had watched, for at least seven years, two cases similar to the one now shown. One in which the ethmoids had been thoroughly removed, and there was no discharge present, yet the swelling continued. The other case—which at first sight suggested a nasal polypus—the President had seen with him at the Middlesex Hospital some years ago. He had received various suggestions for treatment such as cutting out pieces, burning with the cautery, etc.; all these he had tried, but with very little benefit. He was, therefore, glad to hear suggestions as to the treatment of this condition.

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Dr BROWN KELLY said he had had two similar cases, with marked soft swelling on both sides of the septum causing antero-superior bulging following submucous resection. Both patients had suffered from vasomotor rhinitis, and to this he attributed the swellings. It was conceivable that after the submucous resection and before complete healing had occurred, the frequently recurring swelling and œdema of the tissues, especially of the erectile tissue in the region of the septal tubercles, would force the flaps apart and keep them apart sufficiently long to allow of loose connective tissue developing between. On interrogating the present patient, symptoms of vasomotor rhinitis were found to be present. The presence of pus also raised an interesting point. He had had several cases in which vasomotor rhinitis or asthma was associated with accessory sinus disease, and when the suppuration was cured, the asthmatic and vasomotor symptoms passed off. In these cases there was, almost surely, sensitisation of the patient to bacterial proteins.

Mr J. F. O'MALLEY said that, in 1911, he exhibited before the Section an identical case though not so extensive; there was double ethmoid sepsis with polypi, and much bilateral œdema of the septum which anyone could mistake for polypoid masses protruding into the passages. In that case he removed the ethmoid cells, but no improvement in the œdema followed. He then resected the septum, with likewise no improvement. He next excised a wedge without causing perforation, and this made only a slight alteration in the condition. He concluded it was due to some lymphatic obstruction, and so long as there was a mass of tissue there, with the lymphatic outlet obstructed, a certain amount of œdema must occur. Sir William Milligan's suggestion might help to relieve the tendency to the œdema, by fixing the tissues and reducing their size.

Sir ST CLAIR THOMSON suggested that as this swelling had been punctured and no fluid was found, the title should be altered to "pseudo-œdema," since the present title was misleading. As to the nature of the tissue, he referred Mr Wright to some work done by Dr Pegler, many years ago, and shown to the Section, in which this condition was present without polypi, and without a septum resection having been performed. Dr Pegler's slides showed the swelling to be a lymphoma. The speaker had seen a fair number of these cases with and without sinus trouble and septum resection. One of them was in the early days of septum resection, when he performed the operation for hay fever, but it left the patient in a worse state than before, because formerly there was only a temporary turgescence of the septum, whereas a permanent condition followed. His own experience confirmed the opinion of Mr Somerville Hastings, and that of Dr Brown Kelly, that the condition resulted from a neurosis, sensitised, probably, by infections from the ethmoid and other sinuses.

Mr CHARLES A. PARKER (President) said the discussion had shown these conditions were not uncommon; he could himself recall several cases, and he agreed that no method of treatment seemed to be of much service. He had tried removal of the swelling, but recurrence occurred. He agreed with Sir William Milligan's view that there was probably an underlying perichondritis or periostitis, which led to a difficulty in removing the whole disease and hence to recurrence.

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Mr A. J. WRIGHT (in reply) said he thought there was no cavity present, but the swelling could be emptied by slow pressure, a fact which was against it being a post-hæmorrhagic or post-suppurative collection of fluid. It was in the tissue of the septum. Having watched this slowly develop for two years, he thought the patient would be more comfortable by removal of the whole swollen septum, but he had not had the courage to do this, and no one in the discussion urged it. The patient had ethmoidal suppuration and nasal obstruction, and if the ethmoid cells could be sufficiently removed, the condition of the septum might improve. He had not tried diathermy, but on two occasions he had inserted a galvano-cautery point into the swelling, making a submucous linear cauterisation, which was followed by further swelling. Therefore he was somewhat doubtful as to the result which would follow diathermy. In this class of case vasomotor rhinitis was not an entity to him: he did not know where the pure vasomotor condition ended and where the suppurative began. Patients suffering from ethmoidal suppuration seemed frequently to have attacks of sneezing, with a watery discharge; but he had hesitated to call the attacks vasomotor rhinitis in the presence of an obvious gross infection.

**Bismuth and Glycerin Gauze**—Sir ST CLAIR THOMSON, M.D.—The strips of gauze are laid evenly over the mucous surfaces of the outer and inner nasal walls and kept in position with others between them. About three or four strips are used in each nasal cavity, which is not tightly plugged. This allows of some drainage. When removed at the end of thirty-six to forty-eight hours, the absence of reaction and the quiet condition of the mucous surface are remarkable.

The gauze is prepared as follows: The gauze, which is of fine mesh, is cut 1 in. wide and 3 in. long, removing all lint and threads. It is soaked in equal parts of glycerine and water, dried with a towel and impregnated by rubbing on sufficient bismuth subcarbonate to cover the gauze, but not enough to have an excess quantity which would fall off. It is put up in packages of two dozen and sterilised in steam steriliser. Bismuth and glycerine gauze had proved remarkably satisfactory as a post-operative nasal dressing.

Mr H. J. BANKS-DAVIS reminded members of the possibility of nose-splints being swallowed by patients unless they fitted tightly. Some which were stated to have been "sneezed out" by the patient were eventually passed *per rectum*, having been sucked into the nasopharynx and swallowed with the nasal secretions.

Mr HOWARTH said that he could testify to the value of these plugs. He had used similar plugs for the last ten years since he saw Dr Coakley, of New York, use them in his clinic. He, however, preferred the subgallate of bismuth to the subcarbonate.

Dr BROWN KELLY said that for many years he had used bismuth subnitrate, which was introduced by Dr J. L. Howie. It was easily removed, and could, if necessary, be left in the nose for several days.

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Sir ST CLAIR THOMSON (in reply) added that the hygroscopic action of the glycerine kept the turbinates from becoming congested, and that the bismuth was very soothing to the mucous membrane. The present was the most satisfying preparation he had ever tried.

### **Epithelioma of Nasal Septum, Floor of both Nostrils, Alveolar Surface Upper Jaw, and Left Side Lower Jaw—**

ANDREW WYLIE, M.D.—Male, aged 34, painter, complained of an obstruction in his left nostril for four weeks. On examination a hæmorrhagic spongy growth, bleeding profusely if touched, is seen on both sides of septum, and has caused a perforation. There is the same condition on the floor of both nostrils, the alveolar surface of upper jaw and the left side of lower jaw. The disease is spreading rapidly. On transillumination, distinct dullness on the right side. No enlargement of the spleen. Pieces were removed from the septum and jaw and sent to the pathologist. Dr Williamson reports: "A very malignant epithelioma." Wassermann negative. Dr Salisbury Sharpe examined the blood and reports: "Hæmoglobin, about 77 per cent.; red cells, 2,308,000; white cells, 10,360; slight leucocytosis."

The disease is spreading, and the exhibitor wishes opinion on treatment. He intends to get some teeth removed and apply diathermy, if possible, to the nose.

Mr H. J. BANKS-DAVIS said it seemed almost impossible that the condition could be an epithelioma, as it had started at so many points. He understood from Dr Wylie that the patient was at present almost at death's door, and he did not think epithelioma could make a man so ill in so short a time. With regard to the microscopical section, it seemed to him to consist of small round cells and inflammatory tissue: he did not observe indications of so typical an epithelioma as it was said to be.

Dr WILLIAMSON said that, in his opinion, the section was not that of epithelioma, but consisted only of granulation tissue.

Dr WYLIE (in reply) stated that the patient was very ill and was not able to swallow food, and the disease was spreading. He hoped to get further specimens for examination.

### **Laryngeal Case for Diagnosis—H. SMURTHWAITE, M.D.—**

A. R., male, aged 45, had large papillomatous mass removed from larynx in July 1917, in Australia. History of twelve years' huskiness previously. Now slight hoarseness, though no worse than after operation. Chief trouble, intermittent pain in right side of throat below tonsil. Larynx: small outgrowth on left cord just above centre, no ulceration; cord moves freely. Suggestions as to nature of growth and as to treatment, if any, are invited.

Dr DAN M'KENZIE said he saw this case immediately after the original growth was removed five years ago by Dr Brady of Sydney, and the condition of the larynx had not changed much, except that the masses had

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increased in size and become more lobulated, and also there was now to be seen a similar patch, which looked like pachydermia, on the right cord. The slow development of the case, its quiet appearance, and the fact that there was also a similar patch on the other cord, led to the hope that it was not malignant, but probably pachydermia.

Mr CYRIL HORSFORD said he thought the patch which had developed on the right cord was of similar structure to that on the left, but he regarded it as papillomatous. The pain on the right side of the throat he believed was due to retained pus in the right tonsil.

Sir JAMES DUNDAS-GRANT thought it advisable to remove a portion for microscopical examination. It was unlikely to be a malignant condition. If the growth interfered with the voice more than it did, the indication for what he suggested would be even stronger.

Dr W. H. KELSON said the larynx looked like what one would expect in a patient who had had a large papillomatous mass removed a few years before, *i.e.*, exhibiting stumps, apparently non-malignant.

Mr J. F. O'MALLEY said that the patient complained of pain at one particular spot on the right side of the neck, and on examination some secretion was seen to be held up in the pyriform fossa on that side. If the patient was asked to press outside on the spot about which he complained, it disturbed the position in which the fluid was held up, while when he relaxed his finger it was seen to recede. He could not see evidence of growth beneath the secretion in the pyriform fossa. He agreed there was general thickening of the cord.

Mr ARCHER RYLAND was of the opinion that the small fleshy outgrowth of the left cord was producing an irritative lesion at the corresponding point on the right cord. He saw no reason why the small tumour should not be removed, and thought this would probably result in improvement in the voice.

Mr H. SMURTHWAITE (in reply) said the man had complained a good deal about the right side from time to time, but he (the speaker) could find nothing wrong there. He probably had a small concretion in the tonsillar fossa on the right side, causing the pain. His desire had been to ascertain whether it was advisable to remove part of the left cord.

**Operative Procedures in the Treatment of Stenosis of the Larynx caused by Bilateral Paralysis of the Abductor Muscles, with Special Reference to a New Method by means of which the Airway may be Permanently Enlarged, and the Patient Decannulated**—IRWIN MOORE, M.Ch. (See *Journal of Laryngology*, May, 1923, p. 236.)

## DISCUSSION.

Dr W. HILL said that, in 1908, he had discussed the question of cordectomy for abductor paralysis with Sir Felix Semon, in a case in which he (Dr Hill) proposed to do arytenoidectomy on the more fixed side. He thought he could do this through the mouth by the direct method. He

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seized the arytaenoid with a large pair of forceps and pulled, but the joint was fixed, and as there was a great deal of bleeding he had to give it up. A few days later, when the œdema, which followed, had gone down, he performed a laryngo-fissure, and here again an alarming hæmorrhage occurred. He had a tracheotomy tube in the trachea, but the hæmorrhage compelled plugging of the larynx and the operation was never completed. If the operation could be easily performed, he (Dr Hill) thought it would be the ideal way of dealing with these conditions ; but the possibility of an alarming hæmorrhage must be borne in mind. When the arytaenoids were removed in any other way, such as for malignant disease, his experience was that the joint was not fixed. But in paralytic conditions there was a post-paralytic contracture, causing what was almost ankylosis, and the operation might be as embarrassing as the one he had related. On theoretical grounds, he thought that the posterior end of one cord was the part to deal with.

Professor S. G. SHATTOCK, F.R.S., said that, pathologically or theoretically, the operation of stripping the ventricle or extracting the sacculus would not, in his opinion, produce an effective result, because there would not be enough lateral retraction. If the sacculus were removed, two raw surfaces simply cohered. Even if granulation took place, there would be next to no retraction in the horizontal direction. Members of the Section might be able to help Dr Irwin Moore with a name for the new operation.

Mr J. B. CAVENAGH (speaking of cordectomy by the endoscopic method) said this operation should be divided into two stages, viz., "tube" and "suspension." He had recently seen a case in which cordectomy was carried out by the latter method and he had been struck by the extreme simplicity and ease with which it was effected with the patient suspended. He thought it must be much more difficult to carry out with the ordinary tube.

Mr SOMERVILLE HASTINGS suggested to Dr Irwin Moore that in working out the details of this operation it might be useful, as a first stage, to make a vertical incision in the middle line through the thyro-hyoid membrane. He said he had used a vertical incision on a recent occasion to remove a growth from the anterior commissure, as it could not be removed by any other method. Through such a button-hole incision the exact level of the cords could be determined, and then a transverse incision could be made through the thyroid cartilage at that level.

Mr F. HOBDAV said that he had operated upon nearly 2500 horses. In the case of hunters, this operation had now practically supplanted the old tracheotomy. He was proud that the operation had been suggested as a means of alleviating the condition described as occurring in man. Veterinarians, of course, had much more space in which to do the operation on the horse ; they were able to work through the crico-thyroid membrane only, and that was one of the improvements which he (Mr Hobday) personally claimed to have introduced. As the operation was originally demonstrated to him, the thyroid was cut through with a saw, the incision being large enough to admit four fingers. In the present operation only a small incision was made, great care being taken to avoid injuring the



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cartilage; that was one of the reasons the operation had been such a success. In answer to Professor Shattock, he said he had tried to find a dog which had bilateral paralysis, a condition which was occasionally found in the greyhound and other running breeds; but he had not yet succeeded. If he could succeed in performing the operation of ventriculectomy in a small animal like the dog, and bring the specimen to the Section, it would constitute another step towards the performance of the operation on man. Stripping of the ventricle was now done otherwise than with the finger, by means of a small burr with jagged teeth at the edges, which was inserted into the ventricle and slowly twisted in one direction. This everted the sacculus without difficulty. He (Mr Hobday) preferred using the finger, partly because he was not satisfied with burrs, some of which were made very sharp. Some patterns had to be coated with gauze, so as to enable the ventricle to adhere to them. The cartilage should never be injured, as in the horse that led to ossification. In Italy he had seen the operation performed with the electric cautery. In whichever way the operation was performed it must be done delicately and gently, to ensure success in a large proportion of cases.

Mr JAMES BERRY said that twice he had seen bilateral abductor paralysis following thyroid operations. One case was that of a man upon whom bilateral removal of a parenchymatous goitre had been performed by a surgeon in the country. For the ensuing bilateral abductor paralysis another surgeon had done first tracheotomy, then two or three open operations for the removal of the cords in an endeavour to clear the airway. The ultimate result in that case was that another and a permanent tracheotomy eventually became necessary. The other case was that of a young woman with bilateral abductor paralysis which had supervened after he (the speaker) had tied one superior thyroid artery for Graves' disease. Owing to his absence at the war, no further operation had been done for the Graves' disease. Although the physician who had shown him the case had attributed the paralysis to the previous operation on the artery, it seemed very unlikely that this had had anything to do with it. The ligation had been a very simple procedure. Healing had occurred immediately without any trouble, and the laryngeal symptoms did not occur until nearly two years later. The operation Dr Irwin Moore had just described seemed a very ingenious one. But, as an old anatomical teacher, he (Mr Berry) asked whether an objection to the operation did not lie in the fact that the so-called vocal "cord" was not a mere cord, nor even merely the edge of a membrane, but rather the inner and upper border of a triangular mass of tissue containing muscular and other structures in close relation to it. Surely, therefore, it would be difficult to displace the cord outwards against the resistance of this mass of tissue. He would have thought that the mere operation might easily lead to a great deal of chronic inflammatory thickening. He would like to see the operation done, and have a chance of inspecting the patient some time afterwards.

General Sir JOHN MOORE said he would like to amplify the remarks that had been made by Mr Hobday concerning the operation on horses, particularly with regard to army horses. When he (Sir John Moore) joined the Army thirty-five years ago, the operation for "roaring"

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consisted of excision of the arytaenoid cartilage, and it was a failure, for in nearly every case there ensued ossification of the larynx. In veterinary practice great care had to be taken in operations on cartilage. Even with tracheotomy he had found great stenosis of the trachea afterwards. The present operation for "roaring" in horses, *i.e.*, stripping of the ventricles, was an unqualified success. During the war there were many cases of "roaring," and when a horse had "gone in the wind" it was not of much use for army purposes; therefore it was cast and sold. That was what happened in the early stages of the war. Later, however, the young officers took up operating, doing the operation which was introduced by Mr Hobday. Statistics showed that, in one hospital at least, 90 per cent. of the "roaring" horses were put back to work.

**Pharyngeal Pouch**—ARCHER RYLAND, F.R.C.S. Ed.—Male, aged 70, complains of gurgling noises in the throat, and of return of particles of food into the mouth, especially on lying down. The history is one of years. There has been no wasting, no disability of any serious kind, and the general health is good. The skiagram is shown, and reveals a large spherical shadow in the position always occupied by a dependent pouch from the upper œsophagus.

Mr F. H. DIGGLE (dealing with the phrase that the pouch was in its usual position) said he had two cases under his care, the skiagrams of which he projected on the screen. The first patient was a man aged 58, who suffered from osteitis deformans, with curvature of the spine, and the radiogram was taken obliquely. A small pouch was revealed in the exact mid-line. For the last few months, patient had experienced a choking, two or three hours after meals, and coughed up a few bread-crumbs. The other patient, a male, aged 68, complained that when he went to bed he could not sleep because of a "gurgling noise" he produced, and again the pouch was exactly in the mid-line. In what percentage of cases did the pouch remain in the middle line? and, if so, on which side of the neck in case of operation should the incision be made? He also asked what operation should be performed. The ostium being in the middle line, it was difficult to think of a two-stage operation. Ought the policy in such cases be to wait in the hope that when the pouch got larger it would be deflected to one side?

Dr W. H. KELSON said he thought the best course in this case was to leave the condition alone, for evidently the pouch was causing very little inconvenience, and a man aged 70 would probably die of some other complaint. The best guide for making an incision was to pass a probe from above into the pouch and feel its position externally.

Dr W. HILL said that these acquired pulsion pouches always originated in the mid-line; and passing through the inferior constrictor it was only the lower end of the pouch which took a direction to one side or the other, and nearly always to the left. All that was required, in order to ascertain its position, was a screen examination from behind. He had had only one case in which the fundus of the pouch went to the right. He offered to operate on that patient, and in that case would have operated on the right

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side of the neck, but the patient declined. Congenital aëroceles passing through the thyro-hyoid membrane, due to a congenital defect, belonged to a different category, and were always laterally situated, passing from one pyriform fossa. Though pharyngeal pouches were rare, nearly two hundred cases of pharyngeal pouch and fistula had been recorded as long ago as 1901. This was stated by Sir Rickman Godlee and the late Mr Rupert Bucknall in the paper reporting their own case published in that year.\*

Professor S. G. SHATTOCK, F.R.S., agreed with the suggestion of Dr William Hill that this pouch should be described as pharyngeal. He did not agree that these pouches always arose in the middle line. He knew of one specimen in which the origin of a lateral pouch lay immediately behind the posterior border of the thyroid ala, and which exactly corresponded with the fourth branchial pouch—the condition, *i.e.*, was of congenital origin, though its size showed that its increase was subsequently due to pulsion.

Mr ARCHER RYLAND (in reply) said that he accepted the suggested term “pharyngeal pouch.” By “usual position” he meant the middle line of the neck. No speaker had made any suggestion as to active treatment or operation in this case, and he certainly did not intend to employ any such measures. The patient suffered no real disability, and kept, in fact, very fit and well.

**Skiagrams showing Simple Fibrous Strictures of the Œsophagus in a Child**—ARCHER RYLAND, F.R.C.S. Ed.—Child, aged 3, in August 1922, swallowed caustic soda, which was followed by increasing difficulty in swallowing. 6th November: Skiagrams taken and treatment commenced. At this time the child was only able to take liquid nourishment slowly. By œsophagoscopy, the upper stricture was seen and located at 14 or 15 cm. from the upper incisor teeth. The stricture was seen to be small and annular in character, and the lumen was displaced posteriorly. No cicatricial bands or pockets were visible. Dilatation was commenced by means of No. 1 gum elastic urethral catheter.

6th December. No. 12 catheter now passes without difficulty through the upper stricture to a distance of 18 cm. from the upper incisor teeth. The child is now able to take soft solids, *e.g.*, bread and butter, etc.

11th January. No. 12 hollow bougie filled with barium sulphate is seen on the screen to be arrested abruptly at a distance of 18 cm. from the upper incisors. No. 5 bougie enters stomach fairly easily.

Dr W. S. SYME said he had had three such cases in the past year, and there were several difficulties in connection with them. In one of his cases it was impossible to pass a bougie blindly, and when using the

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\* Rickman, J. Godlee and T. R. Bucknall, “A Pharyngeal Pouch of Large Size removed by Operation” (with bibliography), *Med. Chir. Trans.*, 1901, lxxiv, pp. 465-483.

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œsophagoscope it was easy to see why that was so. The upper portion passed up into the œsophagus, like an *os uteri*; and it was only by passing the œsophagoscope and anchoring the pyramidal portion that a bougie could be passed through the œsophagoscope. He thought such cases would require to be bougiéd all their life. One of the suggestions made when he showed cases at Glasgow, was that after passing the bougie it would be well to paint the strictured portion with silver nitrate solution. He had done so, and afterwards it had not been necessary to pass the bougie so often as before that application was used.

Mr ARCHER RYLAND (in reply) said that he had examined this case, in the first place, as far as was possible with the œsophagoscope, in order to make sure there was no pocket cicatricial band, or *os uteri*-like condition, complicating the entrance to the upper stricture. In the œsophagus, unfortunately, there were three strictures—one at 14 cm. from the upper incisors, one at 18 cm., and one at 21 cm. The last named was the narrowest and most intractable. He had had some success by repeated efforts at dilatation with graduated bougies, and proposed to persevere with this treatment at frequent intervals. He did not regard with favour any plan for the retrograde dilatation of the lowest stricture.

**Dentigerous Cyst of Third Molar**—M. VLASTO, F.R.C.S.—The patient has suffered from a foul tasting discharge and right facial neuralgia since February 1921. At the operation, on 22nd November, a sinus was present just behind the right upper second molar. The third molar being unerupted, a probe passed through the sinus was arrested at  $\frac{3}{4}$  in. On the evidence of the X-rays, and the absence of nasal discharge, the diagnosis of a follicular odontome was made. The alveolar incision opened up a large cavity, the roof of which was formed by the floor of the orbit, the inner wall by the middle meatal region of the nose and the anterior wall by the very thinned-out posterior wall of the antrum. The contained tooth and lining cyst wall were removed, and a good deal of the bony margin.

**The Valvular Action of the Ventricular Bands**—Sir JAMES DUNDAS-GRANT, K.B.E., M.D.—A female patient with normal larynx; when she makes a straining effort the edges of the ventricular bands are seen to come into close apposition, while the upper surfaces bulge slightly, indicating distension of the ventricles by air compressed in them by the expiratory effort.

**Cystic Laryngeal Growth anterior to Vocal Cords**—ANDREW WYLIE, M.D.—Male, aged 76, formerly accustomed to shout. In 1905, I removed a large growth, which was attached to the anterior end of the left vocal cord, with Whistler's forceps. Dr Wingrave described the growth as a "soft fibro-papilloma." Patient has been fairly well since, until the last twelve months. He consulted me to-day, eighteen years after removal, and the condition now found is the following:—A large cystic-looking growth, freely movable, and

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as far as can be seen, attached to the anterior commissure, but probably it is growing from the same spot on the left vocal cord at which the former growth was found. The growth is anterior to the vocal cords, which are freely movable; the arytaenoids are slightly swollen. I intend to remove the growth with a laryngeal snare by the indirect method.

**Hoarseness due to Singer's Nodes**—Sir JAMES DUNDAS-GRANT, K.B.E., M.D.—Gradual recovery under rest of voice (restriction to pure whisper) and Curtis's humming exercises. The clinically inflamed tonsils were also removed.

*The President* emphasised the importance of lessons in voice production, and instanced a case occurring in a music hall singer; the hoarseness had been cured by this means alone without rest of the voice.

## ABSTRACTS

### EAR

*On the Technic, Complications of, and Indications for Radical Mastoid Operation.* WITTMACK, K., Jena. (*Zeitschrift für Hals- Nasen- und Ohrenheilkunde*, Bd. 1, Heft. 1 and 2, 1922.)

The "ideal" result was obtained in 21 per cent. of the cases operated on in Professor Wittmaack's clinic. These were found to be cases in which the Eustachian tube was occluded. He therefore advocates a method of closing the canal which had given him the greatest satisfaction, namely, the obliteration of the ostium of the tube by means of knotted iodised catgut. He has found this quite free from danger. It takes the form of a chain of about four knots increasing in size at a distance of from 2-3 mm. from each other. This is drawn through the tube and the appropriately sized knot is caught in the isthmus. It is introduced by means of a bougie, to the outer end of which a fine silk thread is attached. This is tied to the iodised catgut for the purpose of pulling it through. The end of the catgut in the ear is cut as short as possible and pushed back into the entrance of the tube. A pediculated flap is then turned in from the posterior margin of the retro-auricular incision, and is pressed down over the tympanic ostium, being kept there by means of a plug of gauze. At the end of eight or ten days it is generally found to be adherent. The formation of the flap was described and illustrated in the *Proceedings of the German Otological Society*, 1910. He is of the opinion that this proceeding removes a great deal of uncertainty attached to the final result in the radical operation, and renders it,

## Abstracts

therefore, more frequently acceptable as a prophylactic measure against complications than has hitherto been the case. Meningitis, preceded by labyrinthine symptoms, is "*the*" specially dangerous complication. Wittmaack considers that this is not so much due to operative damage to the capsule of the labyrinth or to the windows, as to injury of the internal structures of the labyrinth by a profuse effusion of liquid occasioned by a process of dialysis. To minimise this he advocates the most careful and thorough curetting of the floor of the tympanum and the niche of the round window, also the avoidance of firm plugging such as is effected by indiarubber sponges, which was found to be especially dangerous. He recommends the use of small glass drainage tubes covered with rubber. The tampon used for the fixation of the ordinary plastic flap is confined to the neighbourhood of the antrum, so that the whole of the median wall of the tympanum is free. Deafness of the opposite ear is naturally a contra-indication.

JAMES DUNDAS-GRANT.

*A Case of Gradenigo's Syndrome.* GUNNAR HOLMGREN. (*Acta Otolaryngologica*, Vol. iv., fasc. 4, 1922.)

A woman, aged 24, had suffered for two and a half weeks from acute otitis media of the right ear with mastoiditis. A rigor with temperature of 39.4° C. occurred on the day of admission to hospital. A Schwartze operation disclosed numerous large cells filled with pus behind the sinus and at the base of the zygomatic process, also in the angle between the dura and the sinus a cell of the size of a pea with pulsating contents, in direct contact with the dura mater. After the operation the condition was much improved, but a week later pain about the right eye was complained of, and after a fortnight double vision due to right abducens paralysis was noticed. Two days later there was severe headache and vomiting and the cerebro-spinal fluid was turbid and contained 2000 cells per cubic centimetre. The presence of an abscess in the apex of the petrous was suspected, and the radical mastoid operation was performed. The semicircular canals were then chiselled away, the cochlea being left untouched. Pus was then found "trickling out from below through a hair-like track"; this was followed up and widened, and a cavity the size of a bean was reached, filled with cream-like, markedly pulsating pus and situated medially and in front of the porous acusticus internus. The bottom of the cavity lay 3 cm. internal and anterior to the posterior semicircular canal, and with the probe the pulsation of the carotid could be felt. A wide drainage tube was inserted. At the end of a week the paresis of the abducens had disappeared, together with the signs of labyrinth destruction and a slight facial paralysis which followed the operation. Recovery took place with some hearing still remaining.

THOMAS GUTHRIE.

## Ear

*On the Diagnosis of Stenosis of the Eustachian Tube.* HERMANN STREIT.  
(*Archiv für Ohren-, Nasen-, und Kehlkopfheilkunde*, Bd. 110, Heft. 1.)

In investigating the patency or otherwise of the Eustachian tube, Streit has found inspection of the drum-head during catheterisation more reliable than the method of auscultation, though neither modification of the test provides a certain means of diagnosis.

Suspecting that the degree of patency of the tubes was subject to wide physiological variation, Streit examined 750 normal individuals, taking the utmost precautions to eliminate disease, either past or present. In a great number of cases in which catheterisation was unsuccessful—apparently through no technical fault—it was possible to pass a bougie. A certain residue of cases of apparent stricture in the bony portion yielded after an interval of time, which in all probability allowed some temporary swelling of the mucous membrane to subside. It is important that a transient occlusion of the Eustachian tube may occur normally: treatment in such cases would be mischievous and unnecessary.

The cases in which it was possible to pass a bougie, after inflation had been found impossible, amounted to 4 per cent. This condition of relative stenosis, occurring in persons in whom the hearing tests and inspection of the drum revealed nothing abnormal, was bilateral in ten instances. In rather more than 1 per cent. the tubes were also impermeable to the bougie, although functionally normal.

Having summarised the pathological causes of obstruction of the Eustachian tubes, Streit concludes that the condition is often diagnosed on insufficient grounds, and that a relative stenosis, though possibly of importance in airmen or caisson workers who are exposed to rapid changes in atmospheric pressure, is of no significance in everyday life.

WM. OLIVER LODGE.

*Studies in the War Injuries of the Auditory Nerve.* Dr TEOFIL ZALEWSKI. (*Monatsschrift für Ohrenheilkunde und Laryngo-Rhinologie*, Vol. vii., 1922.)

This report is based on the examination of sixty-six cases of gunshot injuries, affecting the Auricle, the External Auditory Meatus, the Tympanic Membrane, the Middle Ear, and the Mastoid Process.

The author points out that the main characteristic of these injuries is the frequency of involvement of the labyrinth, even where the auricle alone has been wounded—a condition which, of course, has been noted in this country, but which will possibly bear emphasising. He concludes with the following summary:—

1. Involvement of the labyrinth is almost characteristic of a gunshot injury of the ear; only in a few cases is this lesion not found.

## Abstracts

2. The lesions of the labyrinth following concussion, shock, etc., must be regarded as serious. Recovery occurs very slowly, and is sometimes incomplete.
3. Cases of injury to the labyrinth should remain under special observation. They should be carefully examined before their return to the Front, and if their hearing is adversely influenced they should be withdrawn.
4. Artillerymen should be submitted to examination periodically, and those found with progressive labyrinth changes should be withdrawn from the Front.
5. It is advisable, in the artillery, to provide a duplicate service as it is only possible by such means to ensure the necessary maintenance of auditory function in men thus employed.

The article is almost restricted to a statistical and descriptive survey of the conditions.

ALEX. R. TWEEDIE.

*Case of Meningitis arising from Cells in the tip of the Pars petrosa.*  
JOHN KARLEFORS. (*Acta Oto-Laryngologica*, Vol. iv., fasc. 3, 1922.)

This case was one of fatal mastoiditis and streptococcus meningitis in a woman forty-two years of age. The post-mortem examination showed extensive purulent meningitis which had almost certainly spread from cells in the tip of the right petrous bone. These were found filled with granulations and pus which had infiltrated the dura mater around the trigeminus. This condition probably explained the pain which the patient experienced in the right half of the face. Pain of this nature may therefore be regarded as of some diagnostic importance.

THOMAS GUTHRIE.

## NOSE AND ACCESSORY SINUSES

*The Thiersch Graft in the Radical Cure of Frontal Sinus and Maxillary Antrum Diseases.* EASTMAN SHECHAM, M.D., New York. (*Surg. Gynecology and Obstetrics*, September 1922.)

The author claims considerable advantages from immediate skin grafting in cases of sinus disease in which a radical operation has been done. The diseased mucosa is eradicated, weeks of irrigation are avoided, and the nose becomes dry and free from dripping.

The graft is cut from the thigh, taking the papillary layers only. The sinus cavity is freed of diseased mucosa—dried with adrenalin and the graft applied. In the case of the frontal sinus the skin is fixed in position by small pledgets of cotton-wool packed tightly in the cavity and tied to long pieces of twisted silk. These are passed through the



## Nose and Accessory Sinuses

enlarged fronto-nasal duct and out through the nostril. They are left *in situ* for six days. The cavity is not irrigated until the tenth day.

In the case of the antrum the skin can be held in place by a small inflatable balloon passed through the nose, or the cotton pledgets can be used and the mouth opening kept free until after the removal of the plugs. This method has the additional advantage of allowing the operator to inspect the newly implanted skin.

The method is also available for the implantation of skin into the raw tonsil bed after enucleation, and in this case a mould of the cavity is taken—covered with skin and the pillars of the fauces sewn over with mattress sutures. The mould and sutures are removed on the fifth day.

E. MUSGRAVE WOODMAN.

*The Acute Antrum.* T. B. JOHNSON. (*Lancet*, 1922, Vol. ii., p. 1060.)

The author compares the acute antrum with the acute appendix, and believes that sinus cases frequently go unrecognised, to the patients' detriment. He publishes five cases, four of which would probably have remained undiagnosed and drifted into chronic toxæmia, labelled "facial neuralgia," "arthritis," or "chronic nephritis," had not the practitioner been exceptionally observant. The author gives a useful résumé of the literature of toxæmia from sinus infections, and points out that chronic neuralgia, hemicrania, nephritis without a cause, pyrexia without a cause, chronic nasal catarrh, if with a cough, attacks of broncho-pneumonia or a history of frequently catching cold, nasal obstruction, tinnitus, obscure rheumatism or arthritis, optic neuritis, recurring nasal polypi, may all be secondary to sinus infection.

MACLEOD YEARSLEY.

*The Diagnosis of Nasal Sinus Disease in Children.* H. B. LEMERE. (*Archives of Pediatrics*, September 1922.)

The prevalence of sinusitis in children has only been recognised in recent years.

The symptoms are for the most part subjective, and the physician rather than the rhinologist is consulted in the first instance. Such indefinite symptoms, as anæmia, chronic digestive disturbance, loss of appetite, headache and nervous irritability, may often be the result of sinus infection. Frontal headache and redness of the pharyngeal wall just behind each tonsil should lead one to suspect the presence of nasal sinusitis.

The discharge of mucus may be entirely post-nasal and may therefore escape notice.

The writer pleads for a closer co-operation between the pediatrician and the rhinologist so that the true nature of those cases may be more frequently recognised.

DOUGLAS GUTHRIE.

## Abstracts

"*Lower Half Headache*" (*Neuralgic*) of *Nasal Origin*. GREENFIELD SLUDER, M.D. (*Journ. Amer. Med. Assoc.*, Vol. lxxix., No. 23, 2nd December 1922.)

The author states that glossodynia, otalgia, nausea, parageusia, vertigo, photophobia, rhinorrhœa, and asthma may be isolated phenomena not related to "lower half headache" of nasal origin, but controllable from the post-nasal district.

Glossodynia is the most interesting and conspicuous of these conditions. Sluder confirms Dean's observation made in 1921, that this most distressing complaint can be controlled by cocainisation of the nasal ganglion, and permanent relief secured by alcohol-phenol injection of the ganglion.

PERRY GOLDSMITH.

*The Histopathology and Histogenesis of Benign Growths of the Nose and Accessory Sinuses*. H. L. BAUM, M.D. (*Annals of Otolaryngology, Rhinology, and Laryngology*, June 1922.)

In Baum's opinion our classification of nasal growths should be revised in order to avoid confusion resulting from the loose use of terms with indefinite meaning. We should be able to differentiate nasal neoplasms according to their histogenic and pathologic characteristics, and not according to their morphology as we are now constrained to do.

Although many of the conditions mentioned in the paper are rare, it is the opinion of the author that if more rhinologists had acquaintance with the histopathology of the nose, the number of reputed cases would be greatly increased. It is not always sufficient to refer specimens to a clinical pathologist, because his knowledge of gross nasal pathology may be insufficient to aid him in the recognition of conditions which, while quite common in general pathologic diagnosis, might be rare and interesting specimens when considered in relation to their origin and causation.

The paper is illustrated with sixteen micro-photographs, and seventy or eighty references are given to the bibliography.

ARCHER RYLAND.

*The Bacteriology of Ozæna*. K. SAKAGAMI. (*Lancet*, 6th January 1923.)

There is already an extensive literature dealing with this debatable subject.

The writer summarises the results of his researches as follows:—

1. The coccobacillus, found only in ozæna patients, is identical with the coccobacillus of Perez.
2. Experimental ozæna may be produced in rabbits, and the serum of an animal immunised against the organism produces immune bodies with great intensity.

# Peroral Endoscopy

3. Although such immune bodies were clearly demonstrable in animal experiments, the reactions of the serum of patients is rather weak.
4. The coccobacillus may, as a result of those experiments, be regarded as the causative agent of ozæna.

MACLEOD YEARSLEY.

## PERORAL ENDOSCOPY.

*Tracheal Tumours.* Dr GUISEZ. (*Bulletin d'Oto-Rhino-Laryngologie*, Paris, July 1922. Illustrated.)

Guisez reviews the present knowledge of new growths in the trachea, which he points out are rare. The relative frequency of malignant as compared with benign tumours is a point in which the trachea differs from the larynx. The author recounts the varieties of these growths, illustrating the endoscopic appearances. He draws attention to the importance of recognising primary carcinoma of the trachea or bronchus, and records cases of these conditions from his own experience; he mentions also sarcoma.

Treatment is next considered. Tracheoscopy is of first importance for diagnosis; for treatment this method must be reserved for the smallest benign growths, or for applications of radium. Even a very moderate growth is impossible to deliver through the glottis, and a tracheotomy should be performed. For primary malignant conditions two lines may be described. In a very favourable case a resection of the trachea may be entertained. Usually the best results will follow radium applied perhaps when the bulk of the tumour has been ablated, and preferably through a tracheotomy wound. Palliative tracheotomy may alone be possible. E. WATSON-WILLIAMS.

*Relation of the Anæsthetic to Pulmonary Abscess following Nose and Throat Surgery.* C. N. CHIPMAN, M.D., Washington, D.C. (*Journ. Amer. Med. Assoc.*, Vol. 79, No. 7, 12th August 1922.)

This paper deals with two series of pulmonary abscess following operative work on the upper respiratory passages. The first series number 145 cases, and the second 202 cases by Moore. In the latter, local anæsthesia had been used thirty-nine times and gas eight times. As to the origin of the abscess Chipman concludes that it may be either by aspiration or from embolism. Lastly, he gives a few practical suggestions on improving technic before and during operation, as a means of avoiding a lung abscess complication.

PERRY G. GOLDSMITH.

# Abstracts

## MISCELLANEOUS.

*Chronic Infections of the Lower Airways.* IRVING WILSON VOORHEES.  
(*Acta-Oto-Laryngologica*, Vol. iv., fasc. 4.)

There exists a large group of patients who suffer from an unrecognised chronic catarrhal infection of the respiratory mucous membrane. The infection is not merely a superficial one, but the bacteria live and multiply in the deeper layers, and in time bring about much connective tissue proliferation and serious functional changes. The treatment of such cases has hitherto been very unsatisfactory, and the tendency has been to rely too much on "indirect treatment" such as cough mixtures, and attention to the bowels, liver, and kidneys. The important points to be determined are the nature and chief habitat of the infecting organism. The cases can be dealt with by means of autogenous vaccines, which, when properly prepared, the author has found very satisfactory, and also by local applications directly to the region infected, whether in the subglottic area, trachea, or some portion of the bronchial tree. He favours especially for this purpose a 2-per-cent. solution of silver nitrate, a colloidal silver preparation known as "collene," and one or two per cent. dichloramine-T in an oily base. He lays stress on the importance of persistent and repeated applications of bactericidal agents—twice daily in all severe chronic cases.

THOMAS GUTHRIE.

*Atoxodyne; a Completely Atoxic Analgesic.* Dr GUISEZ, Paris.  
(*Bulletin d'Otorhinolaryngologie*, Paris, January 1923.)

Dr Guisez reports his observations on ninety-seven cases in which this product was employed for local anæsthesia. Tested on mice and guinea-pigs, it was less than one-tenth as toxic as novocain; in fact a dose sufficient for some operations on man produced *no* toxic effect on a mouse of 18 grams. The product can be obtained sterile in ampoules, in two strengths (Messrs Scherer, Boulevard Haussmann, Paris), and adrenalin is added at the time of injection. The solution without adrenalin is perfectly stable, and is antiseptic. The anæsthesia is exactly the same as that obtained with novocain.

E. WATSON-WILLIAMS.

*Myxœdema of the Mucous Membrane of the Upper Air-passages.*  
F. KELLNER, Hamburg. (*Zeitsch. f. Hals- Nasen- und Ohren-  
heilkunde*, Bd. 2, p. 247.)

Two cases are described. The thickness and monotonous character of the speech is explained by thickening of the tongue, and the infiltration of the mucosa of the aryepiglottic folds, the

# Endo-Bronchial Mirror

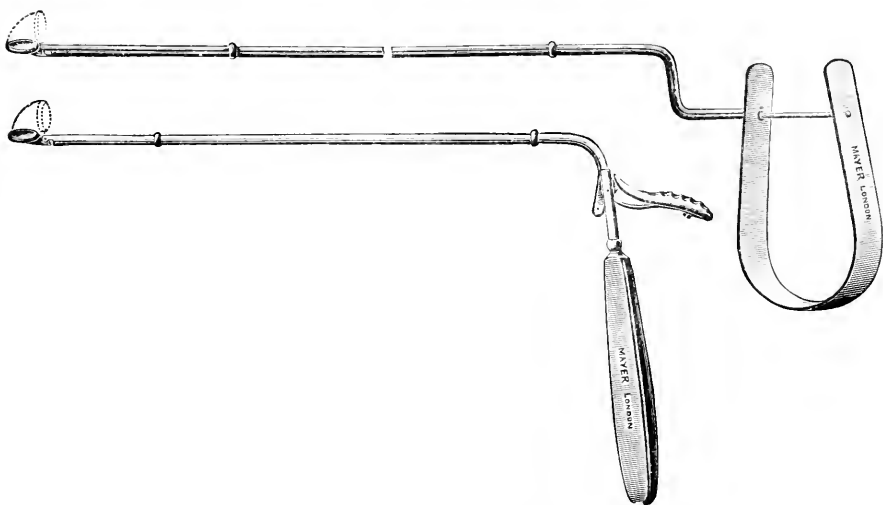
latter preventing the vocal cords from approximating completely. The loss of the sense of smell is due to infiltration of the mucous membrane of the nose, and the dullness of hearing to that of the Eustachian tubes. In doubtful cases of myxœdema an inspection of the upper air-passages may help in the diagnosis.

JAMES DUNDAS-GRANT.

## ENDO-BRONCHIAL MIRROR.

Designed by Dr IRWIN MOORE.

AN adjustable magnifying mirror for employment with the bronchoscope in the direct examination of the lateral lobe bronchi; especially applicable for examination of the right upper lobe bronchus (since it is out of the direct line of vision) in cases of impaction of foreign bodies.



## ENDO-LARYNGEAL MIRROR.

Designed by Dr IRWIN MOORE.

AN adjustable magnifying mirror for the direct laryngoscopic examination of the subglottic region. As expressed by members at the meeting of the Section of Laryngology, on 4th November 1921, difficulty has been experienced, in the past, in ascertaining by direct or indirect laryngoscopy the seat of origin of subglottic growths, or the extension of malignant disease below the vocal cords. This mirror, adapted from Michel's post-nasal mirror, can be adjusted to any angle, and may be passed through a direct endoscopic tube between the vocal cords, and the subglottic region—which has hitherto remained hidden, since it is outside the direct line of vision—may be thoroughly examined.

[These instruments were shown at the Meeting of the Section of Laryngology, *Roy. Soc. Med.*, 5th May 1922.]

## REVIEW OF BOOK

*Bronchoscopy and Œsophagoscopy.* CHEVALIER JACKSON, M.D.,  
Professor of Laryngology, Jefferson Medical College, Philadelphia  
and London. W. B. Saunders Company, 1922.

This is an epitome of the author's well-known compendious work on Peroral Endoscopy and Laryngeal Surgery. Prepared in abstract form in the first instance by one of his readers with a view to obtaining a reader's point of view, Dr Jackson then corrected, revised, and added to it in order to bring the subject matter up to date. To abridge a volume is an admittedly difficult task, but the result is eminently successful, for we have in its reduced bulk, within the handy compass of a manual, the leading principles maintained and the various technical procedures set out in a clear and satisfactory manner.

The larger work on its appearance in 1916 was the subject of an able critical notice in this *Journal* by Dr William Hill, who reviewed at some length the views and technique of the author, comparing them with those in use in this country and on the Continent. It is therefore unnecessary to go into detail on this occasion, and it will be sufficient to allude to a few points which the present volume serves to emphasise.

As is well known, Dr Jackson works with tubes of small diameter. To accomplish what he does with a bronchoscope of 9 mm. for adults and 5 mm. for children, and an œsophagoscope only a millimetre larger is surprising, and to perform it without any anæsthetic, general or local, which he considers unnecessary and often undesirable, is almost like sleight of hand. It is true he uses other sizes for special purposes, but none of them he thinks really indispensable. It will be a relief to the beginner to be told that it is safer for him to use ether anæsthesia, and that as proficiency develops he will dispense with it and even find a local anæsthetic needless for œsophagoscopy. The chapter on acquiring skill will teach him that the education of the eye and fingers can only come by practice.

The value of skiagraphy is strongly insisted on by the author—plates in the antero-posterior and various lateral positions being indispensable. The importance of comparing both sides of the chest where a foreign body in a bronchus is suspected, but is not visible in the plate, is well brought out by illustrations and photographs.

It is, however, on the mechanical problems of foreign body extraction that Chevalier Jackson is at his best. The meticulous care which he enjoins in approaching their solution will be endorsed by all endoscopists. Careful examination of skiagrams, preliminary practice with a duplicate of the foreign body in all positions on the

## Letter to the Editors

rubber-tube mannikin, study of the presentation of the body and selection of appropriate instruments are emphasised as essential preliminaries. "Until all these points are determined it is a grave error to insert any kind of instrument," is thoroughly sound advice. He is insistent that with all bodies having sharp points or edges, the concern is not how to grasp them, but how to protect the point. "Search not for the pin but for the point of the pin." The principles laid down are well illustrated by numerous examples which make this part of the book of especial value. Dr Jackson holds that the extraction of a foreign body is a mechanical problem pure and simple. We are not sure that this expresses the whole truth. An old proverb teaches that technical skill without inspiration loses much of its value, and we may perhaps suspect that some measure of the author's success is "an affair of the spirit."

There are useful chapters on the diseases of the air and food tracts. In papillomata of the larynx, treatment by radium has been of no value in the author's hands. He has even seen extensive damage done. He advocates repeated superficial removal of the growth, "scalping off" with forceps, a view with which most workers in this country are in accord. The term hiatal œsophagismus replaces cardiospasm, the view being taken that the functional closure of the gullet occurs at the diaphragmatic level and is due to the "diaphragmatic pinchcock."

The work is an excellent one, full of valuable information. Containing in a concise form all the essentials which a book on this important subject demands, it will appeal not only to the beginner but also to the practised endoscopist. Needless to say, the diagrams and photographs which illustrate it are of great merit. Dr Jackson is to be congratulated on having produced a manual worthy of his reputation.

D. R. PATERSON.

## LETTER TO THE EDITORS.

### NASO-PLASTIC INNOVATIONS.

TO THE EDITORS,

*The Journal of Laryngology and Otology.*

SIRS,—In the issue of January last, Major Gillies describes a hinged method of applying cartilage grafts to the nose, and as proof of its efficiency he gives two profile illustrations.

Apart from the fact that the operation so described is by no means new, nasal surgeons will naturally ask where is the advantage, as precisely similar cosmetic results have, for many years past, been obtained by the single superimposed cartilage graft. Before accept-

## Letter to the Editors

ing the nasal route both its advantages and the percentage of complete successes will have to be definitely proved, and the extra danger of nasal infection clearly disproved.

It is not shown what thickness of cartilage is used for the septal portion, nor is there any evidence to demonstrate that the cartilage is really giving the support suggested. The difficulty which I have found is that when cartilage sufficiently thick to afford a really definite support is inserted, it may seriously impede the passage of air. Two classes of cases urgently require correction, that resulting from accident and the specific. The former is usually associated with a crumpled septum, and the latter with almost entire absence of the same.

My method of dealing with the question of septal support is probably sounder in principle than that suggested by Major Gillies, and the risk of total loss of cartilage is reduced to a minimum. I introduce the superimposed long cartilage strip in the usual manner, burying a spare piece for future propping purposes if the same should be considered necessary. I sever completely the columella from the lip and septum, and turn it up like the trunk of an elephant; it is then quite an easy matter to introduce a cartilage prop which, if unsuccessful, does not ruin the effects of the first operation. The scar is very soon quite unnoticeable.

The question was raised in the same issue of the *Journal* as to the saving of a portion of cartilage in the event of septic infection. Every truthful plastic surgeon sooner or later has to face this trouble, though the proportion may be reduced by care and experience to a minimum. I consider one of the most important points to be the introduction of a silkworm-gut or horse-hair drain for two days. Once fluid is detected I have found invaluable the flushing out of the cartilage bed, through the original incision, with zinc sulphate followed by ionisation. As I have pointed out elsewhere, many a broken-down operation can thus be saved.

The heading of this letter allows me to draw Major Gillies's attention to the subject of naso-plastic innovations. His method of temporarily burying cartilage required for further use is a valuable and, as far as I know, original idea.

The tubed pedicle flap for nasal and other plastic operations is claimed continually by him as a very valuable innovation.

I must ask Major Gillies and others interested to turn to p. 891 of the *Lancet*, 1917, where the first tubed pedicle flap is fully illustrated. My note, No. 2, under the same, reads as follows: "Separating and undercutting the pedicle and sewing it together tube-wise." This was no sudden inspiration, but the result of considerable experience showing how flaps in themselves become septic from want of protection. The sewing together, where possible,



## General Notes

suggested itself along with skin grafting of the rest. Major Gillies in no way inspired the idea of the pedicle flap, and no case of his showing priority is on record. I must ask that in future he shall acknowledge my original work in the same way in which I have always acknowledged his.—I am, etc.,

J. L. AYMARD,

*Formerly Plastic Surgeon, Sidcup and Aldershot.*

JOHANNESBURG,

1st March 1923.

## GENERAL NOTES

ROYAL SOCIETY OF MEDICINE,

1 Wimpole Street, London, W.1.

*Section of Otology*—Chairman, Sir Charles Ballance, K.C.M.G. *Hon. Secretaries*, F. J. Cleminson, M.Ch., and Archer Ryland, F.R.C.S. Ed. The Annual Meeting of the Section will be held on Friday, 18th May, at 5 P.M.

Members intending to show cases or specimens are requested to give notice of the same to the Hon. Senior Secretary, Mr F. J. Cleminson, 32 Harley Street, London, W.1, at least twelve days before the date of the Meeting.

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SUMMER MEETING OF THE SECTION OF LARYNGOLOGY,  
ROYAL SOCIETY OF MEDICINE, AT MANCHESTER, June 1923.

The Annual Summer Meeting of the Section will be held at Manchester on Friday and Saturday, 15th and 16th June.

The Sessions will commence each day at 10 A.M. at the Royal Infirmary. The forenoon of Friday will be devoted to the reading and discussion of papers. At 1.15 o'clock, the local members of the Section will entertain the visitors to luncheon in the Medical Board Room of the Royal Infirmary.

The afternoon Session, commencing at 2.45 o'clock, will be held in the Out-Patients' Hall, where cases will be examined and subsequently will be discussed in the Lecture Theatre.

Tea will be served in the Medical Board Room.

The *Annual Dinner* of the Section will take place on Friday evening.

At the Saturday morning Session, further papers will be read.

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BRITISH MEDICAL ASSOCIATION, PORTSMOUTH, 1923.

The Ninety-first Annual Meeting of the British Medical Association will be held at Portsmouth from the 24th to the 27th July inclusive, and will be presided over by Mr Charles P. Childe, F.R.C.S.. Senior Surgeon to the Royal Portsmouth Hospital.

The Sectional Meetings are arranged for the 25th, 26th, and 27th. The Sections of Laryngology and Otology have been combined and placed in the two-day Sections.

The following Office-Bearers have been elected :—*President*—Mr Ernest B. Waggett, D.S.O., London. *Vice-Presidents*—Mr Somerville Hastings,

## General Notes

London ; Mr A. J. M. Wright, Bristol. *Hon. Secretaries*—Mr H. Bedford Russell, 86 Harley Street, London, W.1 ; Mr George H. Ross, 28 Kent Road, Southsea.

The titles of the Discussions and the names of those introducing them will be published later.

Original Papers are invited from members of the Association, and it is hoped that the younger members will contribute.

\* \* \*

The Annual Session of La Société Française d'Oto-Rhino-Laryngologie will be held in Paris from the 7th to 9th May, under the Presidency of Professor Jacques of Nancy.

The two main subjects selected for discussion are "Naso-pharyngeal Fibromata," and "Radiography in Oto-Rhino-Laryngology."

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The American Otological Society meets in the Hotel Ambassador, Atlantic City, 14th and 15th May 1923. George E. Shambaugh, M.D., Chicago, President. Thomas J. Harris, M.D., New York City, Secretary.

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The American Laryngological Association meets at the Hotel Ambassador, Atlantic City, 16th, 17th and 18th May 1923. Emil Mayer, M.D., New York City, President. George M. Coates, M.D., Philadelphia, Secretary.

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The Section of Laryngology and Otology of the American Medical Association meets in San Francisco, 25th June 1923. William B. Chamberlain, M.D., Cleveland, Ohio, President. Samuel Iglauer, M.D., Cincinnati, Secretary.

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The American Academy of Ophthalmology and Oto-laryngology meets in Washington, D.C., October 1923. Thomas Carmody, M.D., Denver, Colorado, President. Luther C. Peter, M.D., Philadelphia, Pa., Secretary.

\* \* \*

A Joint Meeting of the Tuberculosis Society of Scotland and the Scottish Society of Otology and Laryngology was held on Saturday, 10th March, in the Hall of the Royal Faculty of Physicians and Surgeons, St Vincent Street, Glasgow.

On the motion of Dr J. Galbraith Connal, Sir Robert Philip, President of the Tuberculosis Society, was called to the Chair. The Discussion upon the Diagnosis, Prognosis, and Treatment of Laryngeal Tuberculosis was opened by Sir St Clair Thomson, who first dealt at some length with the statistical aspect of laryngeal tuberculosis, as it affected the two sexes. His figures, in their relation to the sex incidence, to the influence of nasal obstruction on the development of the laryngeal complication, on the prognosis of cases of pulmonary phthisis, whether with or without invasion of the larynx, and the results of treatment, were based mainly upon his observations at Midhurst Sanatorium.

Sir Robert Philip drew attention to the fact that it was now rare to be asked to see, for the first time, cases of advanced pulmonary and laryngeal disease. He insisted upon a routine, periodic examination of the larynx in all cases of pulmonary tuberculosis.

## General Notes

Dr Logan Turner demonstrated, by means of the lantern, the progress of the laryngeal affection as observed, from time to time, in a number of cases of the disease.

The difficulties in diagnosis were referred to by Dr W. S. Syme, Dr Adam, and Dr Brown Kelly, and the pre-tubercular condition of the larynx was the subject of Dr Harper's remarks.

Dr Struthers Stewart, Dr Johnston, and Dr Crocket, representing the Sanatorium physicians, also dwelt upon the slight changes in the larynx observed in many of their patients, and desired information upon the earliest signs of tubercle in the larynx.

Sir St Clair Thomson, in his concluding remarks, regarded catarrh of the larynx in tubercular subjects as of very frequent occurrence, and he designated the condition as "laryngitis of the tubercular" until the condition cleared up or became a definite case of the disease.

\* \* \*

### THE JOURNAL OF LARYNGOLOGY AND OTOTOLOGY, LTD.

The Second Annual Ordinary General Meeting of the Company was held at 11 Chandos Street, London, W.1, on Friday, 2nd March. Sir William Milligan, Chairman of Directors, occupied the Chair, and submitted the General Report and the balance-sheet of the Company. The latter showed that the publication of the *Journal* for the year 1922 had resulted in a satisfactory profit, which had been applied towards the reduction of the preliminary expenses and to bringing down the value of the copyright. The Report was approved, and Mr Herbert Tilley, Mr W. M. Mollison, Sir James Dundas-Grant, Mr W. G. Howarth, with Sir William Milligan as Chairman, were re-elected Directors.

\* \* \*

On the evening of Friday, 2nd March, the Directors, the Editorial Committee, and a few of the supporters of the *Journal of Laryngology and Otology*, entertained to dinner at the Langham Hotel, Dr Dan M'Kenzie, the late Editor of the *Journal*. It had long been felt that some recognition should be made of the very able manner in which Dr M'Kenzie had conducted the affairs of the *Journal* during his ten years of office, and especially during the trying years of the War. The occasion was also taken to recognise the success of the *Journal* under its new management by entertaining, at the same time, Dr A. Logan Turner, as representing the present Editorial Staff.

The Chair was occupied by Sir James Dundas-Grant, K.B.E., the senior member present, and a former Editor of the *Journal*. He was supported by Sir William Milligan and Sir St Clair Thomson, and the company included, amongst others, Sir Charles Ballance, K.C.M.G., Mr G. A. Carter, Mr G. W. Dawson, Mr Douglas Harmer, Dr William Hill, Mr W. G. Howarth, Dr James Horgan, Mr T. B. Layton, D.S.O., Dr A. McCall, Dr A. L. Macleod, Dr Irwin Moore, Dr D. R. Paterson, Dr Henry Smurthwaite, Mr Herbert Tilley, Mr Michael Vlasto, Mr E. B. Waggett, D.S.O., Dr A. J. Wright, and Mr Archer Ryland; the last named, as Hon. Secretary of the Editorial Committee, was responsible for the excellent arrangements which had been made.

The health of the guests was proposed by Sir James Dundas-Grant, who, in the course of his remarks, referred, from personal knowledge, to

## General Notes

the founding of the *Journal*, in 1887, by Sir Morell Mackenzie and Dr Norris Wolfenden. Of the former, he said, "His personality will never be forgotten by those who knew him. His capacity for making devoted friends was extraordinary : his literary style was perfect, his wit trenchant, yet humorous. Norris Wolfenden had many of the good things of this life, but prosperity did not spoil his appetite for good work, much of which he recorded in the pages of the *Journal*."

"In 1891, John Macintyre of Glasgow became co-Editor with Wolfenden. Macintyre's early studies in the use of physical agents in the treatment of disease were extraordinarily advanced for the time in which they were made and may be read again to-day with profit. In 1893, James Dundas-Grant joined the Editorial Staff with special charge of the new Department of Otology, while Arthur Sandford shared the literary and financial responsibilities and added a tone of cheerful optimism to the otherwise undiverting proprietors' meetings."

"In 1894, the *Journal* enlisted the services of Dr, now Sir William, Milligan, who strove to instil a spirit of business without narrowness. Richard Lake became one of the most active workers, always alert, companionable, and sagacious. Jobson Horne joined the Staff in 1899, with his critical intellect and astounding capacity for work."

"Dan M'Kenzie, sub-Editor for a period, acted as Editor from 1911 to 1920, assisted for a time by Mr Douglas Harmer and Mr Archer Ryland. For ten years Dan M'Kenzie carried on the Editorship of the *Journal* in accordance with the best of the traditions handed down from his predecessors. Through all the terrible years of the war it appeared with regularity. His ready pen supplied material illumined by his racy humour and solidified by his conscientious and critical judgment. His literary capacity has shown itself in the *Journal* pre-eminently, as well as in his various published works. In his *City of Din* he has given us a little gem of thoughtful yet fanciful literature."

"In securing the services of Dr Logan Turner, the *Journal* had been extremely fortunate. Without the frame of a Goliath, he had always displayed the courage of a David. The Directors had found him a sound business man, while in his literary capacity, the Editorial Committee cordially acknowledged the success of his efforts."

The Chairman's remarks were warmly endorsed by Sir William Milligan and Sir St Clair Thomson, who supported the toast. Dr Dan M'Kenzie in his reply referred to Sir James in filial terms, as his professional father, and recounted some of his editorial experiences, humorously describing the different types of literary contributors. Dr Logan Turner gave a short historical sketch of the Publishing House of Oliver & Boyd, and referred to their old association with John Murray, London. The health of the other members of the Editorial Staff was given from the chair and replied to by Dr Irwin Moore. Sir Charles Ballance proposed the health of Sir James Dundas-Grant.

The opinion was expressed that an Annual Journal Dinner should be held on the evening of the day appointed for the General Business Meeting of the Company, and that it should be extended so as to include the shareholders, subscribers, contributors and their guests. It was felt that such a function would help to draw together those who were working in the best interests of the *Journal*.

# The Journal of Laryngology and Otology

(Founded in 1887 by MORELL MACKENZIE and NORRIS WOLFENDEN)

## A CASE OF RHINOSPORIDIOSIS.\*

By J. H. ASHWORTH, D.Sc., F.R.S., Professor of Zoology, University of Edinburgh, and A. LOGAN TURNER, M.D., F.R.S.E.

IN 1900, Dr Seeber, in his thesis presented for the degree of Doctor of Medicine of the University of Buenos Aires, described a parasite in growths which had been obtained from the nasal cavities of two individuals living in Argentina. Seeber attached no name to the organism which he studied with great care, nor did he publish, until 1912, an account of his investigations in any other form than in the above-mentioned thesis. His work, however, was recognised by his teacher, Professor Wernicke, who named the parasite *Coccidium seeberia*,† under which designation a brief notice of the organism appeared in 1903, in Pedro Belou's *Tratado de Parasitologia Animal*.

In 1903, Major O'Kinealy of the Indian Medical Service, unaware of Seeber's work, exhibited at two meetings of the Laryngological Society of London, a microscopic section and drawings of a similar parasite which he had obtained from the nasal cavity of a native of Bihar, India, and who, in 1894, had been his patient in Calcutta. The material from O'Kinealy's case was placed at the disposal of Professor Minchin and Dr Fantham, and these observers, in 1905, published an account of the developmental sequence of the organism, which they named *Rhinosporidium kinealyi*.

\* For a full historical account of *Rhinosporidium* and a detailed description of the structure and life-history of the organism, see J. H. Ashworth, "On *Rhinosporidium seeberi* . . ." in *Trans. Roy. Soc. Edin.*, vol. liii., pp. 301-42, 5 plates, 1923.

† The specific name, being a dedication, should have been *seeberi*.

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As the two parasites to which we have referred are identical in growth, development, and appearance, the specific name *seeberi* must take priority, and *kincaiyi* consequently becomes a synonym. As the organism, however, is not a Coccidium, the genus *Rhinosporidium* which was created for it by Minchin and Fantham remains as the generic name. Hence the correct designation of the parasite is *Rhinosporidium seeberi* (Wernicke, 1903).

Our interest in this comparatively rare nasal affection has been stimulated by the opportunity presented to us of studying, at first hand, a case similar to those described by Seeber in South America and by O'Kinealy and other observers in India. We propose, therefore, to give a short descriptive account of the clinical appearances met with, and of the life-history of the parasite.

Mr M., a native of the State of Cochin on the south-west coast of India, was born in 1891, at Ernakulam, the capital of the State, where he resided until the age of twenty. This point is of interest from the fact that a number of the recorded cases of *Rhinosporidium* have come from this district.

Towards the end of 1910 or early in 1911, the patient became conscious of nasal discomfort, and on inspecting his throat in front of a mirror, he noticed that on deep inspiration a growth became visible below the edge of the soft palate. On subsequent occasions, he found it necessary to push the mass upwards with his finger before he could swallow with comfort. A year later, the growth was removed through the mouth, but owing to its recurrence, a similar operation was performed eight or nine months later. In 1912, while living in Madras, he commenced to suffer from bleeding from the left side of the nose associated with a feeling of obstruction on the same side.

In 1913, he came to Edinburgh to study medicine. The epistaxis continued at intervals, while the escape of a quantity of viscid mucus from the left nasal chamber caused him considerable inconvenience. In 1914, he consulted one of us (A. L. T.) for the first time. The left side of the nose was partially blocked by a pinkish-coloured mass which bled considerably on removal, rendering it impossible either to determine its attachment, or to ascertain whether all, or only a part, had been removed. On two subsequent occasions during 1914 and 1915, the operation was repeated, but owing to the stress of war work, sufficient attention was not paid to the fact that the case presented certain features—to be presently described—which distinguished it from that of an ordinary nasal mucous polypus.

It was not until 1917 that the patient again sought assistance. The

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left nasal cavity was now completely blocked by a pink mass which bled upon the slightest provocation, making accurate observation very difficult. As the free bleeding and the friability of the tissue raised the suspicion of its possible sarcomatous nature, the portion removed, on this occasion, was sent to Dr Rettie of the University Pathological Department for examination. He at once recognised the parasite and handed over the material to one of us (J. H. A.), by whom all the subsequent examinations were made.

During 1917, 1918, and 1920, further removals of the growth were carried out by means of the nasal snare. The polypus presented a very characteristic appearance, which, when once seen, should not be mistaken for any other condition. Of a dull pink colour, though sometimes with a distinctly reddish tint, it took the form of slender filiform or narrow leaf-like processes, the surfaces of which were studded with a number of minute pale spots, due to the presence of the sporangia in the tissue (Plate I, Fig. 1). Exceedingly friable in texture, as already stated, it bled very easily when touched. Associated with the presence of the growth, there was a constant, troublesome, viscid secretion, which, when examined, was found to contain a large number of sporangia and spores. The examination of the mucus from the left nostril was made on many occasions, and spores were always present in it. Mucus blown from the right side of the nose, on the other hand, showed no similar appearance until later in the history of the case.

After the removal of the growth in 1920, the patient experienced a period of considerable relief, but in January 1921 the symptoms recurred, and, for the first time, he complained of discomfort in the right side of the nose. Examination of the mucus from this source now revealed about a dozen sporangia, each containing fully formed spores, while the mucus from the left nostril was found to be heavily infected. On anterior rhinoscopy, a small polypus was seen in the right cavity, while a posterior examination revealed a mass projecting through the left choana.

As the patient had now completed his medical studies, he expressed a desire that some more radical treatment should be carried out. A skiagram was made of the accessory sinuses, and the opinion was formed that these cavities were free from disease, but the lower part of the nasal chambers, especially the left, was distinctly shadowed. As he was anxious to avoid scarring of the face, the Rouge operation was decided upon. This was performed on 12th May 1921.

The detachment and elevation of the upper lip and alæ nasi gave good access to the nasal cavities, both of which contained masses of growth which bled freely and prevented observation of their exact attachment. When the main portions had been removed, it was then

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found that the site of origin was mainly the mucous membrane covering the nasal septum on both sides. Fig. 2, Plate I., illustrates the resected part of the septum, and although the appearance suggests that the whole of the infected area of mucous membrane has not been removed, great care was taken to dissect every trace of the growth from the cut edge of the septum, after cleansing with hydrogen peroxide. Both ethmoidal regions appeared to be normal; the interior of the left maxillary sinus was inspected, but the cavity was empty. With the exception of a small area of mucous membrane immediately below and anterior to the left middle turbinal, which appeared suspicious, and which, consequently, was removed, no evidence of growth could be detected other than that already described upon the septum. The soft parts were replaced and sutured.

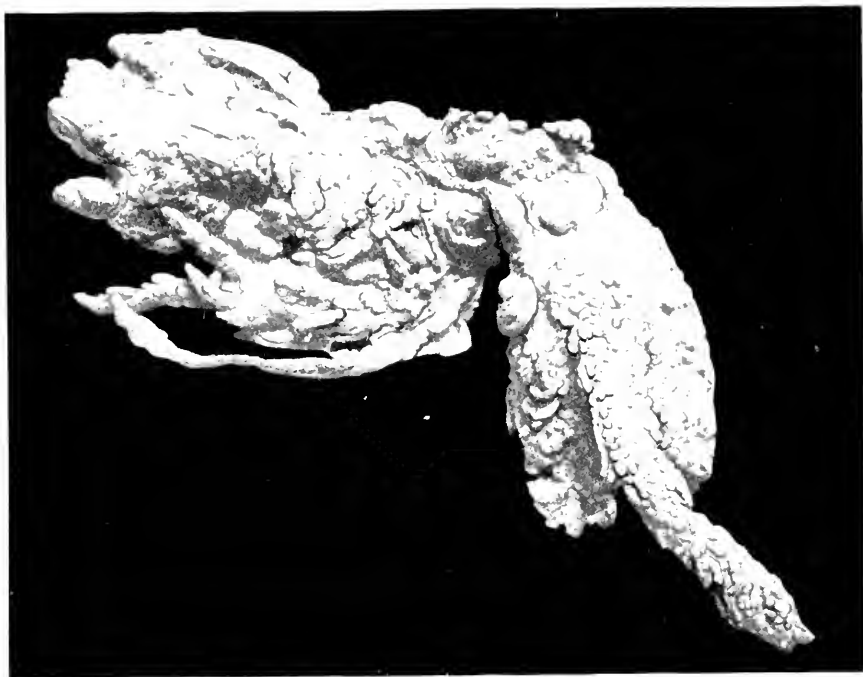
The tissue, after removal, was washed in warm saline and immediately placed in various fixing solutions previously prepared for its reception. The total volume of the growth removed at this operation was 8 to 9 c.c., and the area of the septum which was excised measured 20 by 14 mm.

The patient left Edinburgh in the course of the summer, free from symptoms. A recent attempt has been made to get into communication with him, but, up to the time of writing, without success.

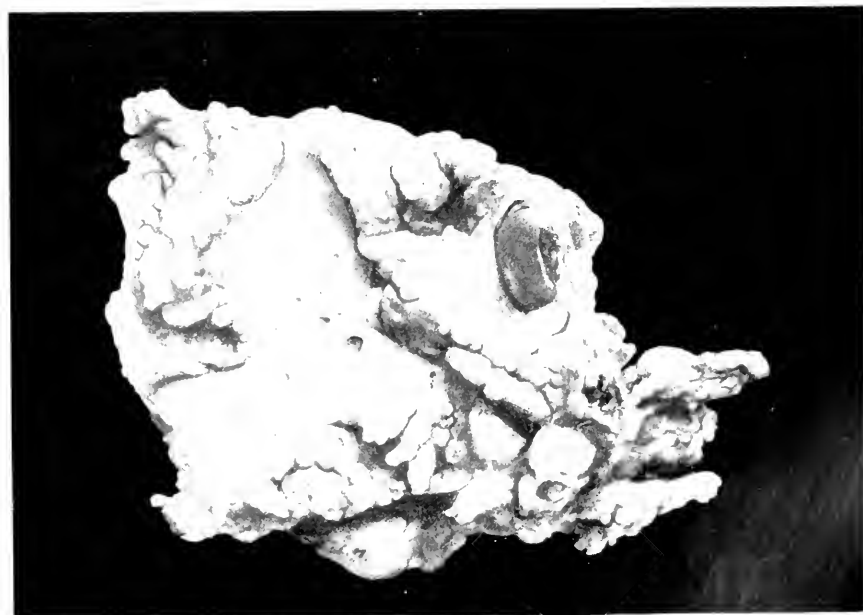
**Histology of the Polypus.**—The growths removed from the left nasal cavity in 1917 and 1918 presented a structural appearance very similar to that of an ordinary nasal mucous polypus. The epithelial layer, consisting of cells mainly of the ciliated columnar type, formed a number of surface folds or indentations; some of the latter were more or less flask-shaped invaginations, with the “neck” closed, so that they took the form of pseudo-cysts. In several of these depressions numerous spores were observed, many of them undergoing degeneration.

The sub-epithelial connective tissue, fibro-myxomatous in character, contained a number of thin-walled blood spaces, some of which were dilated capillaries, others of the nature of venous sinuses. The intervals between the branching connective-tissue cells of the stroma were filled with a structureless fluid; in some areas the œdema had given rise to spaces presenting the character of small undefined cysts. Under the surface epithelium these formed a clear channel near which parasites, especially young stages, were abundant (Plate III., Fig. 21). Numerous parasites in all stages of development lay in the myxomatous





1



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## A Case of Rhinosporidiosis

tissue, feeding on the fluid which it contained. As a result of the œdematous infiltration of the epithelium, individual cells or groups of cells have become isolated, and between the groups, polymorphonuclear leucocytes make their way to the surface. Occasionally a young parasite can be seen within the cytoplasm of an isolated group of cells (Plate III., Fig. 20). Thinning of the surface epithelium, due to the accumulation of spores and leucocytes beneath it, terminates in rupture and in an escape of the spores and leucocytes (and also sporangia) which pass into the nasal secretion.

In the tissue removed in 1920 and 1921, there is observed a greater inflammatory reaction due, in part, to the more chronic condition, and, in part, resulting from post-operative repair. Hence there is evidence of a hyperplasia of the sub-mucous fibrous tissue, and the polypi, though still containing numerous venous sinuses and new formed capillaries, are of fibrous consistence. The cyst spaces already referred to are more defined cavities lined by a somewhat atrophic epithelium. Parasites in all stages of growth lie among the sub-epithelial groups of cells. Scattered areas of recent and previous hæmorrhages are also recognisable.

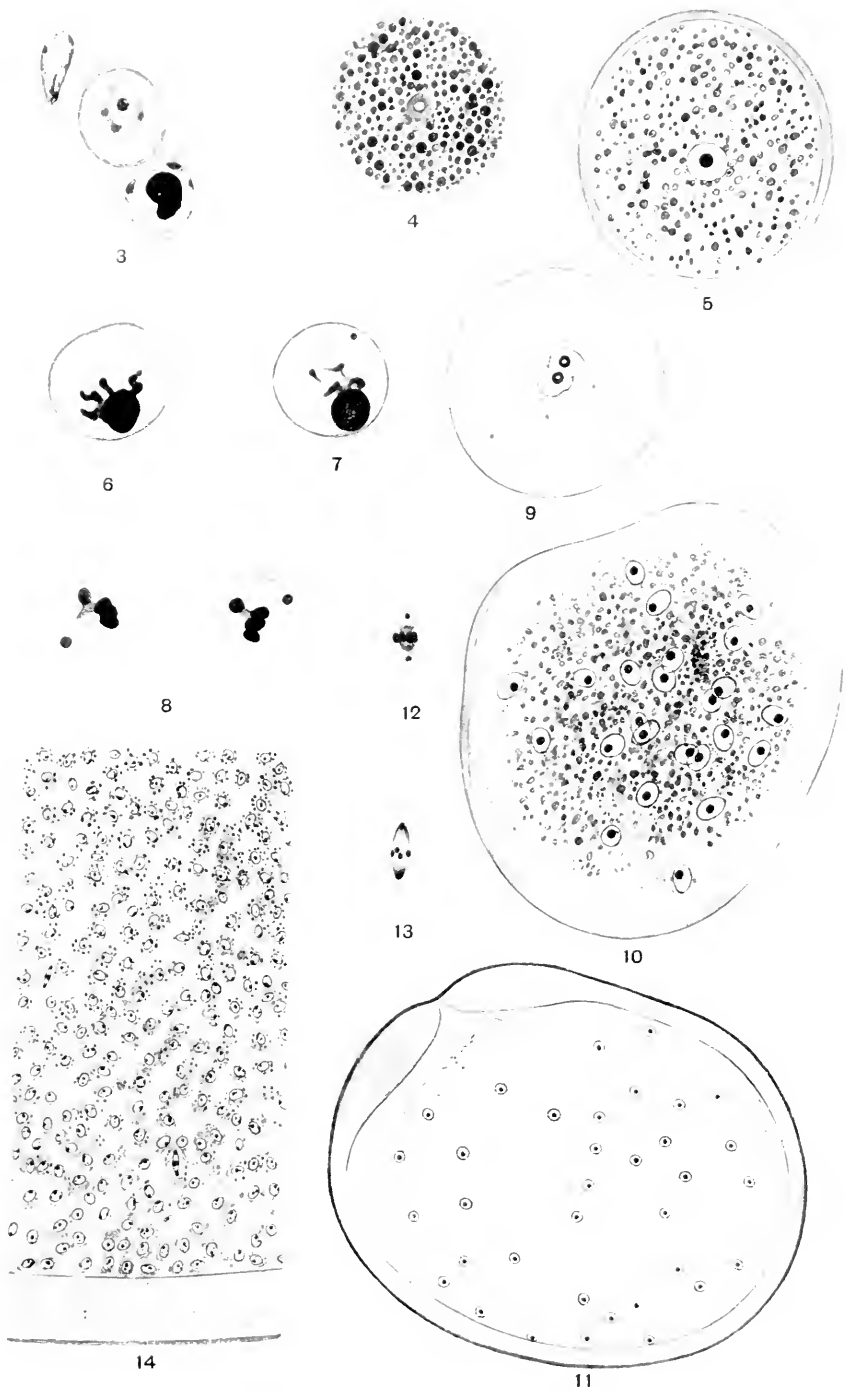
**The Structure and Life-History of Rhinosporidium.**—The earliest stages of Rhinosporidium are about  $6\mu$  in diameter, spherical or oval, with chitinoid envelope, vacuolated cytoplasm, and a vesicular nucleus the chromatin of which is contained in the karyosome (Plate II., Fig. 3). The great majority of the examples  $6$  to  $10\mu$  in diameter met with during the investigation lie between or among the connective tissue cells, often enmeshed in the processes of these cells. Throughout its growth the parasite remains spheroidal or oval and is never amœboid. By the time the parasite reaches a diameter of about  $12\mu$ , granules of protein and fat globules begin to appear in the cytoplasm, and they increase in number and in size (Plate II., Figs. 4, 5), usually until the cell reaches a diameter of  $50$  to  $60\mu$ , when the nucleus prepares for its first division. The karyosome consists of a central achromatic part and a peripheral zone largely or wholly composed of chromatin. The first step in preparation for nuclear division is the issue of chromatin from the karyosome in the form of contorted threads usually four in number (Plate II., Fig. 6); from these, four chromosomes are derived, a spindle is formed with a centrosome at each pole, and mitosis takes place (Plate II., Fig. 8).

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Succeeding nuclear divisions result in the formation of 4, 8, 16, 32 and 64 nuclei (Plate II., Fig. 10). At each division the nuclei undergo synchronous mitosis. The number of nuclei, hitherto a regular geometric series, now begins to exhibit small variations due to delayed or to precocious division of a few of the nuclei, *e.g.*, a parasite about  $98\mu$  in diameter exhibits 132 nuclei, the great majority of which are the products of the seventh nuclear division, but several distinctly smaller nuclei have probably resulted from recent precocious (eighth) divisions. About the time of or shortly after the seventh nuclear division, when the parasite is about  $100\mu$  in diameter and has about 128 nuclei, the envelope, hitherto chitinous and about  $2\mu$  thick, becomes much thickened by deposition of material indistinguishable from cellulose on its inner surface—except at one point where the future pore will be formed for the escape of the spores. Further addition to this inner layer takes place during the next four nuclear generations, by which time the envelope is 8 to  $9\mu$  thick over the greater part of its surface, but is increased to 14 or  $15\mu$  at a thickened annulus which surrounds the site of the future pore (Plate II., Fig. 11). The inner layer is striated due to the presence of fine radial canals.

Mitosis was studied in specimens with approximately 500 and 1000 nuclei respectively, resulting from the ninth and tenth nuclear divisions (Plate II., Figs. 12, 13). The nuclear membrane becomes oval and undergoes solution; the karyosome rapidly enlarges, and a spindle appears with a centrosome at each pole. The chromatin given off from the enlarged karyosome forms four chromosomes, which become arranged side by side at the equator of the spindle. Splitting of the chromosomes has not been actually observed.

Specimens in which the tenth nuclear division has taken place, giving about 1000 nuclei, are on an average 120 to  $130\mu$  in their longest and 105 to  $115\mu$  in their shorter diameters. After this stage it becomes increasingly difficult actually to count the nuclei in the sections, and recourse is necessary to methods for estimating their total number. In specimens with about 2000 nuclei, the cytoplasm begins to condense around the nuclei, and by the time the next nuclear division is completed, the cytoplasmic division is also complete; thus are formed about 4000 cells, each about  $5\mu$  in diameter, which separate from one another and become rounded in outline.





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Two further divisions of these cells take place, the second of which results in the formation of some 16,000 young spores about  $3\mu$  in diameter (Plate II., Fig. 14). The external diameter of the parasite, now a sporangium, is about  $140\mu$ .

The young spores may all grow into fully equipped spores, but more usually some of them—up to about a third—remain unchanged or even undergo some reduction in size. In most mature sporangia, therefore, there are either fully formed spores in the centre and small ones at the periphery, or fully formed spores at one pole (that which bears the incipient pore) and small cells at the other, with intermediate stages in the intervening area in each case. Taking the former case as an example, the steps in transformation of the young spores are as follows:—The central cells in the sporangium begin to enlarge, their cytoplasm becomes vacuolated, and refringent, rounded granules appear, each granule lying in a vacuole. The cell meantime has formed a mucoid envelope, and when it attains a diameter of about  $5\mu$ , a chitinous film is secreted at the surface of the cytoplasm and is subsequently strengthened (Plate III., Fig. 15). Formation of the refringent spherules continues until ten to sixteen are usually present. The spherules are usually  $1.5$  to  $2\mu$  in diameter. The nucleus is vesicular and has a relatively large karyosome. The entire spore, when fully formed, is spherical or oval, and usually  $7$  to  $9\mu$  in diameter (Plate III., Fig. 16).

Many of the refringent spherules in the spores exhibit, in ordinary iron-haematoxylin preparations, a more deeply staining central portion of denser material or of different composition (Plate III., Fig. 17), but this is certainly not a nucleus, as is easily shown on staining sections in alum-carmin or in safranin, which differentiates the spore nucleus very sharply, while the spherules are faintly and homogeneously coloured (Plate III., Fig. 18). The spherules are apparently composed of some proteinaceous substance. They have been mistaken by previous workers for reproductive bodies (spores, sporules, sporozoites).

The growth of the sporangium has resulted in the gradual stretching and progressive decrease in thickness of the wall, which, in examples  $250\mu$  or more in diameter, is only about  $3\mu$  thick. The outer chitinous film has become almost imperceptible, so that at this stage the wall, in effect, is of cellulose. The stretching has also resulted in reducing the annulus to a scarcely perceptible thickening which merges gradually into

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the adjacent parts of the wall. The actual thickness of the wall over the pore is about  $1\ \mu$ .

Many sporangia in the fixed material exhibit stages in the discharge of the fully formed spores (Plate III., Figs. 22, 23), and the expulsion of spores from sporangia freshly passed in the nasal secretions of the patient has been frequently observed. The conditions in the tissue which determine emission of the spores have not been ascertained, but it is evident that any sudden increase of pressure from without, such as may be caused by movement of the tissue in respiration, or, from within, consequent on the absorption of fluid by the mucoid material between the spores, would cause rupture of the thin film over the pore. Through this opening issue the ripe spores accompanied by mucoid material which is clearly seen in the photomicrograph (Plate III., Fig. 23).

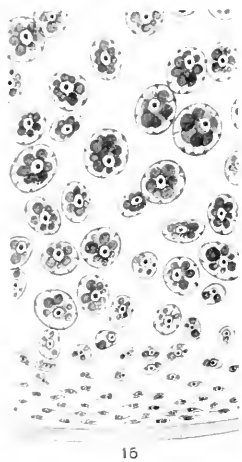
Discharged spores may remain more or less together surrounded by and intermingled with leucocytes (chiefly polymorphonuclear), but, under these conditions, have not been observed to show any signs of growth. By thinning and eventual rupture of the overlying epithelium, the spores and the leucocytes escape and are passed in the nasal secretions, and this is probably the fate of the majority of the spores. Entire sporangia, pressed from below against the epithelium, cause thinning and rupture of the latter, and hence sporangia are also present in the secretions.

More than thirty samples of the patient's nasal discharges have been examined fresh or in stained smears, since May 1917. In the stiff mucus, which was usually copious, were present entire sporangia (from three or four to a couple of hundred), a vast number of loose spores, and many refringent spherules liberated from broken-down or ruptured spores. The mucus also contained many epithelial cells, blood in varying amount, and large numbers of leucocytes—chiefly polymorphonuclear.

Prolonged search has been made for evidence of re-infection of the nasal tissues through the epithelium by means of spores shed from a neighbouring surface, but we have been unable to find in an epithelial cell either a spore (which could scarcely be expected there) or an undoubted early trophic phase. Renewed investigation is required before such a mode of re-infection can be regarded as excluded.

Other spores discharged from sporangia become distributed in the tissue, and the main channels of distribution are the tracts

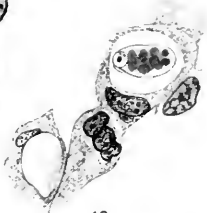




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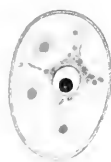
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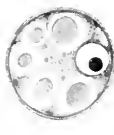
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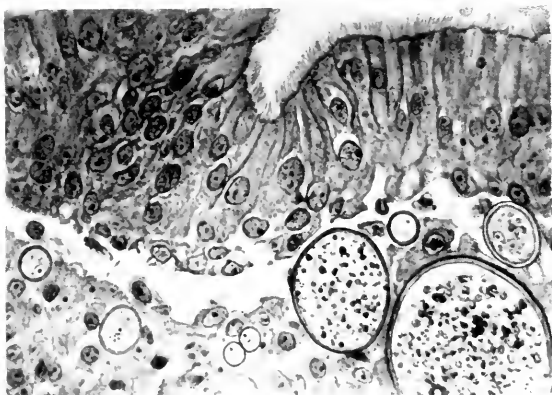
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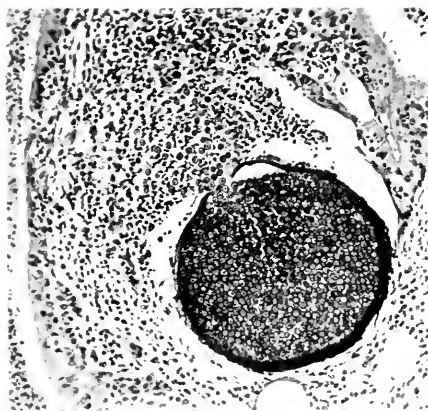
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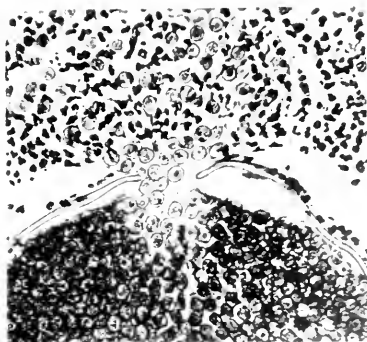
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## A Case of Rhinosporidiosis

of lymph exudate and especially that commonly present just below the epithelium. As the spores, themselves non-motile, are swept along this lymph space the majority enter the connective tissue (Plate III., Fig. 21)—no doubt the path of least resistance—but a few pass into clusters of cells which are being cut out from the base of the epithelium by œdematous infiltration into the latter, and others have been found in mononuclear cells—probably phagocytic cells—at the base of the epithelium or in the adjacent connective tissue. In these situations the stages of transformation from spore to trophic phase have been met with (Plate III., Figs. 19 and 20). The former represents an oval spore, about  $9 \times 5 \mu$ , lying in a vacuole in a cell—apparently a phagocytic cell—situated in the connective tissue. The characteristic nucleus and spherules of the spore are readily recognisable, but the spore envelope has become very thin. Fig. 20 represents the condition immediately after the transformation and before growth has begun to take place, that is, when the parasite is in the earliest trophic stage. This example—others practically identical in size and structure occur in phagocytic cells—is situated in a cluster of cells cut off from the base of the epithelium and lying in the sub-epithelial lymph space. The parasite has formed its new cell wall and the spherules have disappeared, but in the cytoplasm are vacuoles, similar in arrangement to those which contained the spherules in the spore (*cf.* Plate III., Figs. 16, 20). The new cell wall is probably secreted at the expense of the spherules, for in this and all other examples with the new envelope the spherules have disappeared.

In the adjacent connective tissue other trophic stages similar to or slightly larger than that shown in Fig. 20 are common, as, for instance, in the specimen of about the same size, but drawn at twice the magnification, shown in Plate II., Fig. 3. Fig. 21 serves to illustrate the frequency of these early trophic stages in the connective tissue immediately below the sub-epithelial lymph space.

All the appearances point to the lymph as the principal means of transport of the spores, and therefore of the spread of infection in the tissue.

It is suggested that the repeated synchronous mitoses, the late division of the cytoplasm in the formation of spores, the absence of residual cytoplasm, the mucoid material between the spores, and the cellulose envelope of the sporangium, indicate

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that the nearest relatives of *Rhinosporidium* are not the Sporozoa but the lower fungi (Phycomycetes), such as the Chytridineæ, in which sub-order *Rhinosporidium* is provisionally placed.

**Anatomical Situations in which *Rhinosporidium* has been found in Man.**—Up to the present time no case of *Rhinosporidium* has been recorded in the female sex. In the great majority of the cases—more than thirty in number—polypi have been described as occupying the nasal cavities and nasopharynx. The growths are usually attached to the anterior and upper part of the cartilaginous septum, though they have also been situated farther back in the nasal cavity. R. E. Wright has recorded a case in which the polypi sprang from the inferior and middle turbinals, while in two of Tirumurti's cases they were situated in the posterior nares, in a third in the nasopharynx, and in another, the growth depended by a thin pedicle from the posterior nares into the pharynx. A similar appearance was noted in the earlier stages in our case. Wright and Trimurthi record a papillomatous growth of the uvula due to the presence of *Rhinosporidium*.

Conjunctival growths have been described in six cases, and Kirkpatrick and Wright each record a case in the lachrymal sac. J. M. Beattie has reported the condition in aural polypi, and Ingram records a case on the penis.

**Geographical Distribution.**—The majority of the individuals affected with *Rhinosporidium* have been natives of India. O'Kinealy first observed the *Rhinosporidial* tumour in a native of Bihar, and, subsequently, he saw seven or eight patients in the hospital in Calcutta. Most of the recorded cases have been natives of Southern India, chiefly from the West Coast, the Malabar district, and the State of Cochin, though others have been reported in Madras, Perambur, Trichinopoly, Dindigul, and Tinnevely. Four occurred in Ceylon, and of these, three, apparently, had never resided elsewhere than in the island.

Seeber recorded a third case in 1912; his three patients lived in Argentina: one of them, born in Italy, had been taken to South America when one year old; he was nineteen when seen by Seeber. In 1907, J. Wright described a case of *Rhinosporidium* in the nose of a farmer who had never lived elsewhere than in the neighbourhood of Memphis, Tennessee, U.S.A. The occurrence of a related organism, *Rhinosporidium*

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*equi*, Zschokke, in a horse in South Africa, extends the range of the distribution of the genus to another continent.

**Mode of Infection.**—In the present defective state of our knowledge of the behaviour of the organism outside the human body, if it does so exist, it is impossible to say how the infection is spread. It is evident from the study of our case that large numbers of spores are discharged from the surface of the nasal growths and escape into the nasal secretions. While it is natural to suppose that this should constitute the obvious method of spreading infection from one person to another, no proof of it has been obtained, and every endeavour to infect animals by introducing spores into their tissues has been so far unsuccessful.

During the eight years in which our patient lived in Edinburgh, no similar case, to the best of our knowledge, has occurred either amongst the students of medicine or the citizens, although during that period the patient's nasal secretion constantly carried a possible source of infection. He himself had no knowledge of having been in contact with an infected person, and he could offer no explanation of the origin of his complaint. Tirumurti has furnished evidence of two students living together, and both were afflicted with *Rhinosporidium*. One of Ingram's patients was aware that eight or ten persons in his village suffered from the same condition, and that there were other cases in three or four of the adjacent villages. While the possibility of direct infection is obvious in these instances, there are other cases in India in which no similar history can be obtained. The case of the farmer in Memphis is, on the available evidence, one of extreme isolation.

It is possible that in those individuals in whom the polypus was attached close to the anterior nares, infection by the finger may have taken place, as has been suggested by J. Wright. The fact that the nose and eyes are most frequently the seat of the growth is compatible with an air-borne infection, but it is remarkable that the affection has been found only in males, and usually during the earlier years of life. Thus, the age incidence in nineteen recorded cases is as follows:—One became infected at about the age of 8, eight between the ages of 13 and 16, four from 18 to 19 years of age, three between 21 and 24, one at about 30, one (infection of penis) at 39 years, and one (conjunctival case) at about 55.

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The existence of some common factor, such as might be furnished by the occupation of the various individuals affected, has been considered, but the information on this point is somewhat limited. One of Seeber's patients and the only case reported from the United States were farmers; both were white men. O'Kinealy's first patient worked among raw hides. Another patient was a policeman. It may be assumed that a number of the infected natives from the Indian villages were farm workers. Our case and others, however, were in no way connected with an occupation of this kind. The whole question must be left undetermined at the present time.

**Inoculation and Culture.**—Every attempt in India to inoculate the material into monkeys, guinea-pigs, and rabbits has thus far proved a failure. Notwithstanding this fact, experiments were carried out by Dr Rettie with material from the present case. Sporangia, spores, and minute pieces of tissue infected with various stages of the parasite were injected into animals with negative result. One hundred sporangia were washed in Ringer's solution and then placed in sterile water in order to cause expulsion of the spores: the latter were then injected into the nasal septum of two rabbits and two guinea-pigs, but examination of the nose during the next five months revealed no sign of any tissue growth. One rabbit was killed, and the mucous membrane from the site of inoculation was removed and cut in serial sections, but no trace of the parasite could be found.

Cultures were also prepared by Dr Rettie in tubes containing respectively human, ox and horse serum, agar and serum, and Sabouraud's medium. Some were kept at the temperature of the room, others at 23° C., but in none did any growth take place. Attempts by Dr Malcolm Wilson to germinate the spores were likewise attended with no success. In a flask culture, sown with spores by Dr Rettie, were found, some weeks later, oval cells with nuclei resembling those of *Rhinosporidium*, but it has not been found possible to establish the genesis of these cells.

**Treatment** consists in the surgical removal of the infected areas of tissue. In those cases of nasal infection in which there is a considerable development of polypoid tissue, complete removal by the snare through the anterior nares is attended with great difficulty, and some more radical measure, such as was adopted in our case, may prove necessary. Various

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antiseptics, including eusol, were employed in the form of sprays, but without success. Major R. E. Wright has recently used a 2 per cent. aqueous solution of tartarated antimony in a case of *Rhinosporidium* of the conjunctiva. The solution was employed thrice daily in the form of drops, and the growth entirely disappeared in the course of three months. He advocates the treatment of the nasal variety of the affection with the same agent, suggesting spraying and packing of the affected cavity.

## DESCRIPTION OF PLATES.

The figures are reproduced from the account by one of us in the *Trans. Roy. Soc., Edinburgh*, vol. liii., 1923.

### PLATE I.

- FIG. 1.—A portion of the growth removed in July 1917, to show its papillose character, and also the slender filiform extensions. Numerous sporangia are visible on the surface of the polypus.  $\times$  about  $3\frac{1}{2}$ .
- FIG. 2.—The portion of the nasal septum excised in May 1921, showing numerous polypoid excrescences in most of which sporangia are visible. The principal polypoid growth, which formed a large convex mass, was cut away from its base of attachment which is represented by the dark oval area near the upper right-hand corner of the tissue.  $\times$  3.

### PLATE II.

- FIG. 3.—A very early trophic stage,  $6\mu$  in diameter, lying between connective tissue-cells (p. 289).  $\times$  2300.
- FIG. 4.—Trophic stage about  $48\mu$  in diameter, to show the nutrient reserves (fat and protein) about at their maximum (p. 289). Preserved in Flemming's fluid without acetic acid.  $\times$  600.
- FIG. 5.—Trophic stage about  $65\mu$  in diameter. The fatty material has been dissolved out during the preparation, but the protein granules remain (p. 289).  $\times$  600.
- FIG. 6.—Nucleus of a parasite (about  $50\mu$  in diameter); to show the outflow of chromatin, as four contorted threads, from the karyosome (p. 289).  $\times$  2300.
- FIG. 7.—Nucleus of a parasite (about  $40\mu$  in diameter). The chromatin which has issued from the karyosome has formed a sinuous band in which four components (chromosomes) are indicated. The intranuclear centrosome is shown (p. 289).  $\times$  2300.
- FIG. 8.—First nuclear division in an oval parasite  $70 \times 60\mu$  in diameter; showing in each nucleus the centrosome, the four chromosomes, and an achromatic body (p. 289).  $\times$  2300.
- FIG. 9.—A specimen (about  $40\mu$  in diameter) in which the first nuclear division had recently been completed (p. 289). As a rule specimens in which two or more nuclei are present are considerably larger than this.  $\times$  750.
- FIG. 10.—Section ( $10\mu$  thick) of a stage with 64 nuclei, 24 of which lie in this section (p. 290).  $\times$  600.
- FIG. 11.—Section of a stage with about 500 nuclei. To show the envelope formed of a thin chitinous external layer and a thick inner cellulose layer, the position of the future pore and the thickened annulus around this (p. 290).  $\times$  600.

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FIG. 12.—A nucleus from a specimen with about 1000 nuclei in which the eleventh nuclear division was taking place.  $\times 2300$ .

FIG. 13.—A nucleus in rather later prophase; the spindle is more clearly marked, and the chromosomes have undergone condensation (p. 290).  $\times 1700$ .

FIG. 14.—Represents a tract along one-half of the diameter of a central section of a sporangium containing about 16,000 cells (young spores). CE., cellulose layer; CH., chitinous layer of envelope (p. 291).  $\times 1150$ .

## PLATE III.

FIG. 15.—A similar tract from a sporangium in which the central cells have become almost transformed into fully equipped spores with refringent spherules in their large vacuoles, while the peripheral cells have decreased in size and show evidence of pressure. The margin of the common mucoid mass in which these peripheral cells lie is indicated (M). The envelope of this sporangium (about  $240\mu$  in average diameter) has become stretched and consequently diminished in thickness (p. 291).  $\times 1000$ .

FIG. 16.—Two spores from a section stained with iron-haematoxylin, showing the vesicular nucleus with its karyosome, and the spherules each with a deeply stained central portion (p. 291).  $\times 1000$ .

FIG. 17.—Section ( $3\mu$  thick) of a spore  $10\mu \times 7\mu$ ; to show the envelope, the nucleus with karyosome, the cytoplasm, and the vacuoles, three of which contain refringent spherules. The central part of each of these spherules is more deeply stained with iron-haematoxylin (p. 291).  $\times 2000$ .

FIG. 18.—Section of a spore  $8\mu$  in diameter, with excentric nucleus. Stained with alum carmine. The spherules stain homogeneously (p. 291).  $\times 2000$ .

FIG. 19.—A spore in a cell, probably a phagocytic cell. The nucleus and the spherules of the spore are practically unaltered, but the envelope has become very thin (p. 293).  $\times 1000$ .

FIG. 20.—The earliest trophic phase recently formed from a spore; in a cluster of basal epithelial cells which lie in a sub-epithelial lymph space (p. 293).  $\times 1000$ .

FIG. 21.—Section through the epithelium, the sub-epithelial lymph space and the adjacent connective tissue containing six trophic stages. The two near the middle are each  $7\mu$  in diameter. Immediately to the right of these is a trophic stage about  $30\mu$  in diameter which was being forced out of the connective tissue, and would soon have begun to press into the epithelium (p. 293).  $\times 500$ .

FIG. 22.—A section showing a sporangium  $245\mu$  in diameter full of ripe spores, and the beginning of the discharge of spores. There are numerous leucocytes to the left of the sporangium, and the epithelium had almost given way at one point (p. 292).  $\times 120$ .

FIG. 23.—A portion of the same sporangium more highly magnified. The mucoid material is seen escaping with the spores through the pore (p. 292).  $\times 250$ .

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## NASAL DISFIGUREMENT AND ITS CORRECTION.

By DOUGLAS GUTHRIE, M.D., F.R.C.S.E., Surgeon to the Ear and Throat Department, Royal Hospital for Sick Children, Edinburgh.

DURING the war, many operations were undertaken for the restoration of mutilated features, and the surgeon, in co-operation with his dental colleague, achieved many remarkable results. In civilian practice, the plastic surgery of the face has a more limited application, but is none the less important.

The possessor of repulsive or ridiculous features is often at a disadvantage in the business world. One of my patients, an expert metallurgist, had difficulty in securing a post on this account alone; another, a shopkeeper, told me that she felt so sensitive of her appearance that she feared she must change her calling.

Perhaps the most common of facial disfigurements is that which affects the nose, and many unfortunate persons are to-day undergoing mental tortures such as afflicted Cyrano in Rostand's famous satire.

**The Nature of the Deformity.**—During the past three years there have come under the writer's care 18 cases of sunken bridge or saddle-nose, 2 cases of loss of columella (1 lupus, 1 syphilis), 1 case of loss of entire nose (electric burn), and 1 case of enlargement of the nose (congenital). It would appear that the most frequent type of nasal deformity consists in a defect of the bridge, and the following notes refer to this condition only, the other cases having been already described elsewhere.\* The treatment of saddle-nose by cartilage grafting is a well-recognised surgical procedure and has been practised by Gillies, Carter, Cohen, Skillern, and others with satisfactory results.

**The Cause of Saddle-nose Deformity.**—Injury ranks first, and was responsible for 13 cases in the present series. The importance of early treatment of all nasal injuries is not yet fully recognised. When the nasal bones are fractured or dislocated the surgeon is careful to reduce the displaced parts, but when, as more often happens, the fracture is limited to the septal cartilage, the injury is less apparent and is therefore

\* See *Edinburgh Medical Journal*, December 1921.

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liable to be overlooked. It commonly consists in a crumpling of the septal cartilage and a depression of the upper lateral cartilage.

Accurate restoration may be secured by the use of Adams' forceps to adjust the fractured septum, and by a rubber-covered elevator to raise the depressed parts. The nose may be lightly packed, and a splint, cut from thin sheet copper and suitably padded, may be moulded to its exterior. Many cases of obstruction and deformity might be prevented by a timely treatment of nasal injuries. In most of the cases of the present series the injury had been inflicted during childhood, and the patient did not come for treatment until adult age had been reached.

The operation of submucous resection of the nasal septum is probably responsible for the deformity in only a small number of cases, as operators are now well aware of the danger of removing too much cartilage, and of operating at too early an age.

Of the 13 traumatic cases here reported, two had undergone this operation for the relief of nasal obstruction, but in both the deformity existed prior to operation. Lupus was the cause of deformity in 2 cases, the disease, as well as the cicatrization which followed, having produced a depression of the bridge. One of those patients had also suffered loss of the columella; the other presented the appearance illustrated in Case 2. Syphilis was responsible for 3 cases, and in each the destruction of tissue was so extensive that reconstruction of the nasal bridge was insufficient to restore the facial contour. The entire nose, and not merely its dorsum, had become depressed and shrunken, owing to absorption of the bony margins of the pyriform aperture. Case 3 illustrates the fairly successful result which may be obtained by cartilage grafting.

The frequent destruction of the nasal septum in syphilis, and the presence of much scar tissue within and around the nose, are other factors which render the deformity very difficult to treat.

It need hardly be said that no operation of nasal reconstruction should be undertaken, until the original disease (lupus or syphilis) has been effectively treated, although a positive Wassermann reaction need not be regarded in all cases as a contra-indication to operation.

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**The Technique of the Operation.**—The repair of a sunken nose can best be effected by cartilage grafting. This is much superior to the injection of paraffin, as no foreign body other than the patient's tissue is introduced. Moreover, the cartilage may be carved to any desired shape, and persists for years without undergoing any shrinkage or absorption.

On 3rd April 1920, I operated on an officer who had injured his nose in an aeroplane accident. Costal cartilage was used to rebuild the defective bridge. In October 1922, he reported that "the nose has kept its shape perfectly and gives no trouble."

It may be mentioned that this patient subjected his nose to a severe strain by taking part in an expedition to Spitzbergen three months after the operation!

In some cases it will be necessary to perform a resection of nasal septum for the relief of obstruction, as well as cartilage grafting for the cure of the deformity. This was done in 7 cases of the present series, and in three of those cases the removed septal cartilage was utilised to restore the bridge.

In the remaining 15 cases the defect was too great to be filled by a thin septal cartilage, and a graft from the costal cartilage of the patient was utilised. The steps of the operation may be briefly summarised. A half-inch transverse incision is made at the root of the nose; then, by means of a sharp elevator, the soft tissues are raised from the bone and cartilage as far as the tip, and to a certain extent also from the sides of the nose, so as to avoid tension. A pocket is thus constructed into which the cartilage graft will snugly fit. The 7th or 8th costal cartilage is then exposed by a vertical incision through the right rectus muscle at the thoracic margin, and an inch or more of costal cartilage is removed, preferably without perichondrium, as the tendency to curl up is thus avoided.

The entire thickness of the cartilage need not be taken unless the nasal defect is deep—an important point when one remembers that the pain after operation is greater when the continuity of the cartilage has been interrupted. The resected portion is then accurately carved to the desired shape and must naturally be thickest where the depression is deepest. An outline model of the defect, in silver wire, which may be boiled with the instruments, is of great assistance in preparing



Case 1.



Case 2



Case 3.



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the graft. The shaped cartilage is next introduced into the pocket prepared for its reception, and the wounds in the nose and thorax are closed by sutures.

Intranasal incision, in the vestibule, has never been practised by the writer, as it renders the operation more difficult and would appear to favour sepsis. In a recent case an excellent result was obtained by incision through the base of the columella, as suggested by Gillies in the *Journal of Laryngology*, February 1923, p. 86. Incision at the root of the nose, however, gives easy and satisfactory access, and the scar is barely noticeable after a time.

After-treatment is simple. For the first twenty-four hours a bandage is used, retaining a firm cotton-wool pad over each eye and each side of the nose, so as to avoid a hæmatoma or a "black eye."

**Results of Cartilage-Grafting.**—When the deformity was due to injury or to lupus, the results of the operation in this small series of cases were uniformly good, and in all cases the nasal contour was completely restored. Syphilitic cases, on the other hand, were less favourable, and although the sunken nose was raised by cartilage-grafting the cosmetic effect was not altogether satisfactory, as the entire nose, and not merely the bridge, had become shrunken and contracted as a result of the disease. In one case (traumatic) treated by a graft of septal cartilage a hæmatoma formed and was evacuated, but this did not delay healing or vitiate the result. In two cases the graft became displaced several weeks after its introduction. The upper end alone was displaced, and was easily corrected by reopening the incision and removing the projecting portion.

The accompanying photographs illustrate three of the cases, in which the deformity was the result of injury, of lupus, and of syphilis. Each patient is shown before operation (left), and after operation (right).

## DESCRIPTION OF PLATE.

CASE 1.—Injury to nose from a fall at age of three. Treated by costal cartilage transplantation.

CASE 2.—Deformity resulting from intranasal lupus, before and after cartilage transplantation.

CASE 3.—Congenital syphilis; bridge repaired by cartilage graft. Note general shrinkage of nose in syphilis.

## OTITIC MENINGITIS.\*

By G. J. JENKINS (London).

BY the term meningitis is to be understood an inflammation of the meninges of the brain and the spinal cord produced by a micro-organism. If an inflammation of the meninges arises secondary to and due to septic disease of the ear, then it must be regarded as a septic meningitis, whether or not an organism has been found in the cerebro-spinal fluid. The purport of this thesis is not so much the academic consideration of individual features of otitic meningitis, as the desire to deal with conditions which tend to be progressive, and which may lead to the fatal disease that we all know.

Much work has been done recently by Kopetsky, Ballance, Eagleton, and others on the advanced stages of meningitis in which micro-organisms have been found in the cerebro-spinal fluid, obtained by lumbar puncture, and a good deal of attention has been given to the operative treatment of these stages; but the conclusion arrived at after careful study of these works is, that we must diagnose and treat the disease at a much earlier stage than that described, if surgical treatment is to have a reasonable chance of success. There are a few cases on record of recovery from septic meningitis even after micro-organisms have been found in the cerebro-spinal fluid, but these are only exceptions to a very general rule that meningitis, when it reaches this stage, is practically a fatal disease.

In these circumstances it remains for otologists to recognise and determine: (1) The septic affections of the ear that are prone to cause meningitis, so that the observer will be more prepared and more likely to diagnose this intracranial complication at an early stage. (2) The symptoms and signs that are associated with the early stages of meningitis, as well as those of the later stages of the disease. (3) The symptoms and signs that will indicate the region of greatest intensity of the inflammation, as well as the probable limits, if any, of the affected area.

Before attacking these problems it is necessary briefly to review other subjects that have a bearing on their elucidation.

\* Abstract of paper read at the 10th International Otological Congress, Paris, July 1922: published in the *Transactions of the Congress*.



# Otitic Meningitis

## Pathology and Pathological Anatomy.

The study of otitic meningitis from the pathological standpoint resolves itself into the application of the principles of inflammation to the complicated meningeal system.

The causative factor is a colony of micro-organisms, situated either in the ear, or in some closely related structure infected from the ear, or in the meningeal system itself, but the progress, pathological and clinical, depends as much on the resistance of the individual to the organism and its toxins as on the nature of the actual organism.

The science of bacteriology has not been helpful to the otologist, except in so far as it affects the general principles of the surgical treatment of septic lesions. There does not seem to be any definite relation between the nature of the organism and the clinical progress. Apparently any of the pyogenic organisms may be causative either of a very acute or of a very chronic type of meningitis. The "strain" or type of a particular organism probably has a relation to the clinical progress, and an endeavour should be made to extend our knowledge in this direction, as possibly the time may come when such knowledge may be valuable in the treatment of meningitis.

It may be useful briefly to consider what is happening in the tissues about a slowly progressing small pyogenic infection in, say, the subcutaneous tissue. In the centre of this area there may be a collection of pus, then a zone of dead tissue in which will be found dead and dying polymorphonuclear leucocytes and some micro-organisms; beyond this is the advancing line of micro-organisms. The line may be so defined in some instances as to appear as such under the low power of the microscope; further beyond is an area, varying in extent, of altered connective tissue filled with polymorphonuclear leucocytes. Furthest from the point of maximum infection is an area in which will be found proliferating connective tissue cells, plasma cells, and lymphocytes. In addition, there are the "general effects" of a localised infection.

Meningitis of aural origin may, up to a point, be compared with such an abscess formation. In this instance the infection is extending from the ear, or some part infected from the ear, towards the meninges. In the early stages, the advancing line of infecting organisms will be outside the dura mater,

## G. J. Jenkins

but nevertheless the inflammatory changes within the dura, if present, must be regarded as being of a septic nature. These changes have a parallel in the two outer zones of the abscess described above. The line of organisms may reach the inner surface of the arachnoid mater, and the more advanced stage of septic meningitis be thus established and changes appear parallel to those of the inner zones of the abscess formation. There are, then, theoretically, two degrees of septic meningitis, one in which the organisms have not reached the internal surface of the arachnoid, and the other in which they have invaded the sub-arachnoid region. This is a theoretical classification, clinically recognisable only in extremely early and late stages, and of no practical value.

An extra-dural abscess is the simplest form of meningitis. In such a condition, only the outer surface of the dura may be affected. The dura mater is very resistant to the passage of infection, except, possibly, where vessels and nerves pass through the membrane, and at the cranial sutures. Weed has demonstrated the impermeability of the arachnoid mater to fluid injected into the subdural space, and it seems as if that membrane is also resistant to the passage of infection. Again, there is evidence that the pia mater is also very resistant to the passage of infection from without. A piece of the cerebellum with its meningeal coverings was removed post-mortem from a case of otitic meningitis (secondary to lateral sinus thrombosis), and examined microscopically. Polymorphonuclear leucocytes crowded the spaces of the sub-arachnoid tissue, but in the loose tissue of the pia, and in the sulci into which the sub-arachnoid space had not extended, there were only numerous plasma cells and a few lymphocytes. Although not demonstrable, there were probably organisms in the sub-arachnoid region; it is, however, unlikely that there were any in the meshwork of the pia mater in association with the plasma cells and lymphocytes. There is, then, a definite stage in which the sub-arachnoid space is certainly infected, and yet the pia mater and brain may be but slightly involved without any obvious destructive changes. In another specimen removed post-mortem from a case in which the changes appeared to be similar, on microscopic examination, there was to be seen a destruction of brain tissue, and a marked polymorphonuclear leucocytosis in the parts involved. It was not obvious that the invasion of the brain tissue was along the cerebral vessels.

## Otitic Meningitis

Obvious meningitis of the sub-arachnoid region may occur, secondary to ear disease, without any macroscopic evidence of disease of the dura mater, and so far I have not been able to demonstrate the track of micro-organisms microscopically.

*The Cerebro-Spinal Fluid.*—The study of the changes in the cerebro-spinal fluid in meningitis is of the utmost importance. These changes have been regarded as affording the most reliable information as to the nature and stage of the meningitis, but there is reason to believe that this source of information is often unreliable, and can only be of full value when considered together with the clinical features.

As the advancing front of micro-organisms approaches the arachnoid, the sub-arachnoid region with the cerebro-spinal fluid is doubtless undergoing changes corresponding to those described as occurring in the outer zones of inflammation.

As the process of inflammation continues to spread inwards, the sub-arachnoid region becomes correspondingly involved by the different inflammatory zones, until finally the organisms themselves have invaded the sub-arachnoid tissue, which now shows the destructive changes characteristic of the inner zones.

It is of the utmost importance, when estimating the value of the evidence obtained by examination of lumbar puncture fluid, to take into account the site of maximum infection. The character of the fluid at the region of maximum infection is not necessarily represented by the sample obtained on lumbar puncture, which has only a relative value.

It would be valuable to know where the various pathological elements originate. The cells, if formed only at the site of maximum infection, must be free, and must obviously be carried by some means for considerable distances from this point. This seems unlikely, and I would venture to suggest that the presence of a localised area of inflammation may produce effects extending over a much greater part of the cerebro-spinal fluid system, in consequence of which, cells may be formed at a spot considerably distant from the original area, and be found in the lumbar puncture fluid. Micro-organisms in an inflamed area may reach distant parts by direct extension, not by the mere mechanical action of the circulating fluid; one would not therefore expect to find them in the lumbar puncture fluid until the more advanced stages of the disease have been reached.

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When the inflammatory process directly involves a sub-arachnoid cistern, as, for example, in a patient suffering from labyrinthitis, the changes are very marked, and rapid in progress: on the other hand, when the meningitis is spreading in the sub-arachnoid space, without involving a cistern, as in a case of primary infection through the roof of the middle ear, then the changes are less marked and less rapid, and the lumbar puncture fluid, in these circumstances, is less likely to indicate the true condition at the site of maximum infection, than is the case in the former instance.

There are, then, two principal factors influencing the character of the changes observed in the lumbar puncture fluid: (1) The site of maximum infection. (2) The stage reached by the inflammatory process. My experience has led me to believe that differences in the character of the lumbar puncture fluid depend far more upon these two factors than upon the particular effect of any given bacterial toxin.

**Infection of the Meninges of the Middle Fossa.**—The path of infection has been through the roof of the middle ear in all the cases that have come under my personal observation. Mr Arthur Cheatle, at the International Congress of 1899, drew attention to the petro-squamosal suture in the roof of the middle ear, and showed that vessels pass through the suture between the petro-squamosal sinus and the veins of the sub-mucous tissue. He suggested that this intimate relation between middle fossa and middle ear, probably accounted for certain intracranial complications of middle-ear suppuration. The anatomy of the part is very suggestive, as is also the fact that middle fossa infection is less common in adults than in children in whom these anatomical features are more marked. It is difficult to find definite evidence that infection of the meninges of the middle fossa is secondary to septic thrombosis, either of the petro-squamosal sinus or of the veins from the middle ear to the sinus, but it is possible that this may sometimes be the case. In most of the cases amongst children under my personal observation, no obvious change could be found in the bone or in the dura mater of the roof of the middle-ear cavity. In adults, gross changes are more common. In some, there is an extra-dural abscess with necrosis of the bony roof of the middle ear, and, in others, abscess is found without any change in the bone.

The intra-dural complications usually met with when there

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are gross changes in the roof of the middle-ear tract are those of localised meningitis and meningeal or cerebral abscess, not those of general meningitis. When infection of the arachnoid and sub-arachnoid space has occurred, there is a tendency for it to spread in an upward and inward direction from the site of infection, rather than forwards or backwards. Very often, at death, no exudate is found at the anterior or posterior parts of the cerebrum. This distribution of the exudate rather suggests that infection produces the maximum effect in the part of the cerebro-spinal fluid system where stagnation has occurred owing to obstruction by the inflammatory exudate.

The changes in the cerebro-spinal fluid cannot be co-ordinated with the condition of the middle fossa, as the early state of the disease can very rarely be seen by post-mortem examination, but there seems no doubt that by careful consideration of the clinical progress of those cases which have been examined post-mortem, we may safely arrive at the conclusion that the changes in the cerebro-spinal fluid obtained by lumbar puncture, in the early and even in the late stages of infection of this spongy region of the sub-arachnoid space, may be comparatively slight. The gross changes in the cerebro-spinal fluid do not occur until infection of the cisternæ takes place.

**Posterior Fossa Infection.**—Infection of the meninges of the posterior fossa may occur by way of the labyrinth and through the posterior wall of the antrum, or they may be secondary to septic thrombosis of the lateral sinus. In those cases which I have personally studied microscopically, the infection has passed from the labyrinth to the meninges, along the elements of the auditory nerve, to the internal auditory meatus. In one case polymorphonuclear leucocytes in numbers were found in the aqueductus Fallopii as far as the internal auditory meatus, indicating a possibility of infection by this route. It is important to note that the infection reaching the meninges by the labyrinth involves the cisterna pontis direct, whereas all other infections are primary infections of the spongy sub-arachnoid space, the involvement of the cisternæ being secondary. Post-mortem examination—necessarily of the late stages—shows the presence of exudate on the surfaces of the pons, medulla, and cerebellum in relation to the cisterna pontis, at the foramen magnum on the anterior and lateral aspects of the medulla and spinal cord, and also at the opening in the

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tentorium cerebelli. It is worthy of note that, in some cases, the cisterna magna and even the posterior part of the upper portion of the spinal sub-arachnoid space remain free from exudate, even though the fluid in the ventricles is markedly turbid. The degree of affection of the middle and anterior fossæ varies considerably.

When the infection follows septic thrombosis of the lateral sinus, the trabeculated sub-arachnoid space is involved primarily and the cisterna pontis secondarily. As might be expected, the exudate indicating the region of maximum infection is mainly on the cerebellum of the side affected, and has, in addition, a distribution similar to that found when the cisterna pontis is directly affected.

**Meningitis Following Abscess of the Brain.** — The commonest cause of death in patients with abscess of the brain is meningitis. The term "abscess of the brain" has been used rather loosely, the diagnosis having been made in many cases that are really instances of abscess of the sub-arachnoid space. A clear distinction should be made between these two types of intra-dural abscess. The sub-arachnoid abscess, more common in the posterior than the middle fossa, is a localised meningitis, and has commonly associated with it some definite changes in the cytology of the cerebro-spinal fluid, whereas in abscess of the brain these changes may be but very slight. Again, with sub-arachnoid abscess there is often mass destruction of tissue from the middle ear to the abscess. This abscess "stalk," as described by Ballance, is often microscopic in true abscess of the brain. The method of spontaneous infection of the meninges, beyond the region of the abscess, is obscure, but when it has occurred the pathological process is similar to that found in the condition above described.

### Symptoms and Signs of Meningitis.

In every case of aural sepsis there lies the possibility of intracranial complications, and we must endeavour, by complete examination, to lessen any risk of missing the earlier stages of meningitis. Even when all care is taken, the early clinical signs of the disease will sometimes be so obscured by the symptoms and signs of the acute or subacute inflammation in the ear as to appear to be part of the effect of the latter.

The analogy between peritonitis and meningitis is not,

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perhaps, perfect, but it may serve to emphasise the importance attaching to any clinical investigation that may help to define the site of maximum infection. It is on this basis that I intend to attack the question of symptomatology. It is only within the last few years that the importance of this aspect of meningitis has become clear to me, and as we do not see many cases in the early stages, there has not been, so far, sufficient material to allow of complete corroboration of my thesis. There are doubtless some helpful symptoms and signs that have not yet been recognised.

**Early Symptoms and Signs in Relation to Site of Primary Infection.**—The character of the early symptoms and signs depends, firstly, on whether the primary infection has occurred in the cisterna, or in the trabeculated sub-arachnoid space, and secondly, on whether the invasion is in the posterior or middle fossa.

Primary infection of the cisterna pontis can only occur through the labyrinth. In all the early cases of such infection that have come under my notice, the meningitis has followed soon after the destruction of the labyrinth. Recognition of this early stage is due to the fact that in all cases of acute labyrinthitis I have regarded meningitis as a probable complication, and have therefore made a complete examination to decide whether or not the inflammation has extended beyond the labyrinth.

When meningitis has followed an extension of infection from a labyrinth which has been destroyed at some remote date, the inflammation has usually passed beyond the early stage before the patient applies for treatment, and the surgeon sees him for the first time with symptoms of meningitis which are obvious. In cases of acute septic labyrinthitis, the patients apply for treatment because of the severe and alarming symptoms due to this condition, which usually completely mask those of the associated meningitis when present. We need not consider the details of the symptomatology of acute labyrinthitis, but may content ourselves with reference to the great nausea, vomiting, and occipital pain, which are common to both conditions. In the cases of acute labyrinthitis that have been under my care in recent years, the lumbar puncture fluid has always been examined, and has usually been found to be normal.

The path of infection is probably by the internal auditory

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meatus, and as the sub-arachnoid space in the canal is a kind of "backwater," it is conceivable that the infection may, for a short time before invading the cisterna pontis, remain local and not give rise to any symptoms or signs (beyond the comparatively slight changes in character of the cerebro-spinal fluid) that would not be overshadowed by the effects of the acute labyrinthitis. With the invasion of the cistern, however, there arises a further set of symptoms and signs due to the effects on the cerebro-spinal fluid system, and associated mainly with a rise in the intracranial pressure. The symptoms may still be obscured to some extent by the labyrinthitis, but there are certain features which are distinctive. One of the most obvious signs of the change is the appearance of a slight torpidity without irritability, a feature recognised by the friends if not by the surgeon. Vomiting commonly occurs, but this may, of course, be due to the labyrinthitis. The temperature is seldom more than  $100^{\circ}$  or  $101^{\circ}$ . In the early stage of involvement of the cistern the pulse rate is not, in my experience, in proportion to the temperature, and is usually low. The occipital headache is bilateral, not localised to the side of the affected ear; there may be some frontal headache as well. At a later stage the pain may be described as general, but more intense over the occipital region. Sometimes there is distinct tenderness at the attachments of the posterior cervical muscles to the occiput, and rigidity of these muscles gradually develops. This rigidity is sometimes difficult to demonstrate until a more advanced stage has been reached, but by extending the dorsal spine by means of pillows placed under the patient, it is often made more obvious. Kernig's sign is usually present, and, as the intracranial pressure rises, the knee-jerks tend to become sluggish, or even to disappear on one side or the other. If continuous sub-arachnoid drainage be satisfactorily established at this stage, all these symptoms and signs may disappear, leaving for the time being only the general picture of a local sepsis, with the symptoms of a labyrinthitis. If, however, the intracranial tension is not relieved, and the inflammation progresses, then the familiar symptoms of advanced meningitis make their appearance. In regard to the significance of changes in the fundus oculi, I am inclined to think that the condition of the fundus does afford some evidence as to the progress of the disease, but I believe that papilloedema is not usually present in the earlier stages.



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The following is an example of the examination of the cerebro-spinal fluid obtained by lumbar puncture from a case of early affection of the cisterna pontis. The patient had bilateral acute mastoiditis with acute labyrinthitis on the right side. There were no symptoms or signs of meningitis beyond the changes in the cerebro-spinal fluid:—

1. Fluid turbid, 5 c.c. withdrawn; total cells, 400 per c.mm.; lymphocytes, 95 per cent.; plasma cells, 4 per cent.; polymorphonuclear, a few; sugar increased in amount.

2. Fourteen hours after the radical mastoid operation on the left side and labyrinthotomy on the right side, 5 c.c. of cerebro-spinal fluid yielded: total cells, 2120 per c.mm.; polymorphonuclears, 90 per cent.; lymphocytes, 10 per cent.; sugar diminished; globulin well marked; no organisms seen and cultures sterile.

3. Twenty-four hours after translabyrinthine drainage, 5 c.c. of cerebro-spinal fluid yielded: total cells, 900 c.mm.; polymorphonuclears, 70 per cent.; lymphocytes, 25 per cent.; plasma cells, 5 per cent.; sugar diminished; globulin less than before; no organisms and cultures sterile; recovery.

There seems strong evidence in these changes, taken together with the clinical aspect of the patient, that the condition was progressive and would probably have ended in general meningitis if the translabyrinthine drainage had not been done. Although there was no direct evidence that the organisms had reached the sub-arachnoid space, I venture to state that they had, in all probability, reached at least as far as that "backwater" in the internal auditory meatus.

**Primary Affection of the Trabeculated Sub-arachnoid Region.**—Inflammation in this part of the sub-arachnoid space usually spreads comparatively slowly, and the early symptoms are therefore more those of a local than those of a spreading inflammation. The infection does not occur through the labyrinth, in my experience, and so the symptoms of meningitis are masked only by those of the acute condition in the middle-ear tract. In the early stage of involvement of the temporo-sphenoidal region, the only complaint may be one of indefinite pain in the region just above the affected ear, or immediately anterior to this. Constant well-defined pain, in this region, in a case of acute aural sepsis, strongly suggests meningeal inflammation. In the early stages the pain may be only slight, but later it may become so severe as to prevent

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sleep and to obliterate all other symptoms. Not uncommonly this area is tender on percussion. Associated with the increased pain of the later stage, there is often marked irritability. The temperature is usually raised to  $101^{\circ}$  or  $102^{\circ}$  F., the pulse rate being in proportion to the temperature (*c.f.* early stage of cistern infection). There may be signs of cerebritis before there are any marked indications of increased intracranial pressure. When the disease reaches the cisterna basalis and the whole series of cisterns becomes involved, the pathological conditions of general meningitis obtain, and the resulting clinical picture is similar to that produced by primary infection of the cisterna pontis with secondary extension on to the surface of the cerebrum.

It is peculiar to this distribution of the meningitis that the lumbar puncture fluid shows comparatively slight changes until an advanced stage is reached, probably until the inflammatory process involves the cisterna basalis.

It is the early stage of this type of lepto-meningitis that most often of all passes unrecognised, probably because otologists pay too little attention to what the patient complains of, and are apt to rely too much on physical signs. Headache, especially when localised to the affected side, should be considered with the greatest respect, even when unsupported by any other symptom or sign, no matter whether the ear condition is acute or chronic.

Affections of the sub-arachnoid space in the posterior fossa have, in my experience, always been secondary to lateral sinus thrombosis, or to abscess (sub-arachnoid or intra-cerebellar), and, in these conditions again, the symptoms of meningitis are obscured until the disease has reached the cisterna pontis.

It is well to remember that the symptoms and signs of a well-advanced lepto-meningitis may be entirely removed by morphia, and its administration is obviously undesirable until the clinical examination has been completed. It seems possible that atropine may also affect the clinical picture by altering the intracranial tension.

The general effects of lepto-meningitis are those of any other localised septic process, though at times obscured by the local effects. A cytological examination of the blood is sometimes of importance, and on two occasions has afforded valuable evidence that enabled me to give a prognosis other than that which I might have given without this information. Usually the

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leucocytosis is very great, but in some cases, when the resistance is low, the leucocyte count in the blood is low. In the two cases referred to, an examination of the lumbar puncture fluid was made, and there were about 2000 polymorphonuclear cells per c.mm. in both cases. Neither case had operative treatment beyond repeated lumbar puncture. In each case there was a sudden drop in the numbers of polymorphonuclear cells in the cerebro-spinal fluid. On cytological examination of the blood it was found that the leucocytes had diminished here also. The patients had septicæmia.

The statement, so commonly made, that septic meningitis should not be diagnosed unless organisms can be demonstrated in the cerebro-spinal fluid is, in my view, not only wholly erroneous, but dangerous. It is a matter of common knowledge that in many cases of very advanced meningitis, in which there have been no two opinions as to diagnosis or prognosis, all attempts to grow organisms from the cerebro-spinal fluid have failed. It is precisely this text-book attitude of mind in regard to the diagnosis of the condition that is responsible for our failure to adopt operative measures for the treatment of septic meningitis at a stage when there is some hope of success.

### Treatment of Lepto-meningitis.

It may be regarded as fundamental in the operative treatment of lepto-meningitis, in whatsoever stage, that the causative ear disease should be eradicated as completely as possible, no matter what other additional procedure is adopted. Such treatment should be sufficient to bring about a satisfactory result in all the milder affections of the meninges (*méningite de voisinage*), when the organisms have not invaded the sub-arachnoid region. There can be no doubt that many cases of this condition are unrecognised, the more so on account of the fact that all symptoms are often entirely cleared up after adopting the radical operative measures usual in the treatment of ear disease. The diagnosis of *méningite de voisinage* is by no means easy, but, even when it has been established, it is advisable at the operation to expose the dura mater over a small area in the posterior or middle fossa, or in both these regions, and twelve hours afterwards to remove, by lumbar puncture, 5 or 6 c.c. of cerebro-spinal fluid for examination purposes; this would be a sufficient lapse of time to allow

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of the appearance of such changes as might indicate the necessity of further surgical interference.

The number of cases of lepto-meningitis treated by repeated lumbar punctures must be enormous, but in only a few of them has recovery been recorded. Lumbar puncture cannot be seriously regarded as a method of treatment for the following reasons:—Cerebro-spinal fluid is an excellent medium for the growth of micro-organisms; the intervals between successive punctures must, of necessity, be considerable, and allow ample time for the multiplication of the organism; furthermore, only a comparatively small portion of the total fluid can be removed at each puncture.

When there is no doubt that the infection has invaded the sub-arachnoid region, there can be no longer any question as to the correct procedure; drainage must speedily be established at the point of maximum infection. When, in spite of all endeavour, there is still uncertainty, then we have to balance in our minds the relative risks involved in leaving a potentially dangerous condition on the one hand and, on the other, in unnecessarily opening the dura mater. Knowing that the risks of the operation as such are practically negligible, there are probably few surgeons who, in these circumstances, would hesitate in their choice. As the endeavour throughout this paper has been to regard otitic meningitis as a condition which is at first local, and having a regional distribution over a varying period of time, it must follow that the treatment, in the earlier stages, at least, should also be regional.

**Treatment of Early Affections of Cistern Region.**—In a primary infection of the cisterna pontis, the natural course of the operative procedure is along the track of the infection, viz., through the labyrinth to the internal auditory meatus. This was first realised by West and Scott, who advised opening into the internal auditory meatus after performing an inferior labyrinthotomy.

Prior to the operation on the middle ear cleft which is conducted preferably under ether anæsthesia and without preliminary morphia or atropine, 5 to 6 c.c. of cerebro-spinal fluid are withdrawn slowly by lumbar puncture. The pathologist conducts his examination and makes his report before the mastoid operation is completed. If the cerebro-spinal fluid is found to be normal, the labyrinth is dealt with as seems best according to the circumstances; but in

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all cases in which there is acute labyrinthitis, superior and inferior labyrinthotomy are carried out. If, however, the report indicates that the inflammation has extended to the meninges, translabyrinthine drainage of the cisterna pontis through the internal auditory meatus is at once proceeded with.

It is important that all bleeding should be stopped before opening the internal auditory meatus. The lodgment of a clot may interfere with subsequent drainage of the cerebro-spinal fluid. The whole operation cavity is first cleaned out with hydrogen peroxide and normal saline, and even the labyrinth is syringed through and the parts are then douched with a 2 per cent. solution of iodine in alcohol. A clean set of instruments is used for the further stage of opening into the internal meatus. The flow of cerebro-spinal fluid should be free. If this does not take place, it is strong evidence that a considerable amount of exudate has formed at or in the meatus itself or possibly about the foramen magnum.

The whole cavity is now rubbed over with iodoform paste, an iodoform gauze wick is placed in the anterior part of the cavity from the inferior labyrinthotomy opening through the external auditory meatus, the remainder of the cavity being then lightly packed with iodoform gauze; the posterior wound is left open or closed, according to circumstances.

Pituitrin is given subcutaneously on the advice of Weed, who asserts that the extract of posterior lobe increases the flow of cerebro-spinal fluid; bromides are given per rectum. The foot of the bed is raised about 12 inches, and the patient lies with the sound ear uppermost.

A remarkable feature in the further progress is the extremely rapid emaciation, which is much more marked if there has been a very free flow of cerebro-spinal fluid. This may possibly be explained as being due to a loss of sugar, and for this reason I give a liberal supply of sugar with the food.

Drainage of the cisterns by the internal auditory meatus has been adopted for many reasons. In the first place, it is in the internal auditory meatus that the maximum infection must be, and therefore any procedure which leaves this back-water undrained must allow the persistence of a dangerous focus of infection. Secondly, the meatus is a natural drainage tube; the sub-arachnoid space is patent to the fundus, and the tube cannot by any means be closed by pressure of the cerebellum; whereas by any other route, with the use of india-

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rubber tubes, metal tubes, etc., there is always the possibility of the tube moving, and the orifice being plugged by brain or other tissue.

**Treatment of Early Affections of Trabeculated Sub-arachnoid Region.**—Treatment of early stages of leptomeningitis in the region of the temporo-sphenoidal lobe must be on a different principle from that described above. It is necessary to do a radical mastoid operation in order to obtain free access to the region which is suspected of infection, even though the local ear condition requires only a simple Schwartze. From the upper extremity of the usual mastoid incision, I make another incision horizontally forwards and backwards, extending it upwards at either end, as necessary. The skull is exposed and removed over a considerable area in relation with the lower part of the external surface, and the outer part of the inferior surface of the temporo-sphenoidal lobe. In doing this, due care must be taken to find, if possible, the track of the sepsis from the middle ear. This area of dura having been exposed, the whole of the wound is thoroughly cleaned by douching with hydrogen peroxide (10 vols.), then with normal saline, and finally, with 2 per cent. solution of iodine in alcohol.

It is my custom at this point to withdraw a certain amount of fluid from the sub-arachnoid region by means of a hypodermic syringe for examination at a later time. I now make a crucial incision in the dura mater, turn aside the flaps, and examine the outer surface of the arachnoid. Sometimes the pus and exudate can be easily seen, but in the early stage in which I propose this operation and hope for success, the changes are not obvious, and can only be detected by microscopic and bacteriological examination of the fluid removed. The operator must be sure that he has exposed the trabeculated sub-arachnoid space by removing some of the arachnoid. This is very resistant to the passage of fluids, and must be removed in part at least. The dressing of the wound is carried out on the same principle as described above.

In treating meningitis secondary to lateral sinus thrombosis, the drainage of the cisternæ must be an important consideration, as the earlier stage of affections of the trabeculated sub-arachnoid tissue in this region is not recognised clinically. In one fatal case I removed the lateral sinus in the region of the mastoid with the surrounding dura mater, as far in as about

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the posterior semi-circular canal, and I also took away some of the arachnoid mater. The cistern was drained by means of a tube passed through the operation wound. After the operation there was complete relief from intracranial pressure, but the septic process advanced and ultimately caused death.

### **The Treatment of the Later Stages of Lepto-Meningitis.**

—How often it is felt that if the patient had been operated on sooner, there might have been some chance of success. We naturally hesitate to resort to severe operative treatment until the patient is obviously in a serious state, and thus possibly we lose the opportunity of being able to do good. The suggestion is that the maximum that can be done by drainage and washing out of the cisternæ, should be done in those cases in which the meningitis has only just passed the early stage, and has not advanced so far that the septic process has involved the pia mater, invaded the brain, or extended into the trabeculated sub-arachnoid region. This stage is difficult to recognise clinically, and it is for this reason that I examine the lumbar puncture fluid removed twenty-four hours after the translabyrinthine drainage. I feel that the probability of a satisfactory result has been increased by the adoption of this routine measure. It is only by experience that we shall learn whether twenty-four hours is or is not too long an interval; very probably it is.

If any changes in the lumbar puncture fluid indicate that the disease has advanced, and that an intermediate stage of lepto-meningitis has been reached in spite of the translabyrinthine drainage, then this measure must be regarded as insufficient. It is necessary to establish free drainage, not only of the cisterna pontis but also of the cisterna basalis, and I think it advisable at the same time to wash out the cisternæ with a modified Ringer's solution (glucose is omitted). The cisterna pontis may be drained by the internal auditory meatus, and in addition, by a tube in front of the cerebellum. The cisterna basalis may be opened by two routes, both of which I have found efficient; in one case I incise the dura mater near the floor of the middle fossa, and pass a No. 9 rubber catheter along the superior border of the petrous bone to the posterior part of the cisterna basalis; in the other case, by an operation in the frontal region, I introduce a catheter by the side of the falx cerebri to the cisterna chiasmatis.

The cisterna magna is usually the last part to be affected

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and may, at this stage, contain more or less healthy fluid, the bactericidal properties of which are valuable, and therefore this space should not be drained, but rather the fluid should be encouraged to flow to the affected area by drainage of the region of maximum infection.

The washing out of the cisternæ has been done in my cases, when possible, by a head of fluid (modified Ringer's solution) from the lumbar region, but the flow is usually obstructed at the foramen magnum by exudate. It is remarkable how often it is possible to draw off a large quantity of cerebro-spinal fluid, and yet find it impossible to wash through to the drainage tube in the cisterna pontis or to the internal auditory meatus, owing to the fact that the communication with the cisterna magna is maintained, whilst that with the cisterna pontis has been shut off.

In cases of obstruction to the flow of fluid from the lumbar puncture, the cisterna pontis has been washed through, in a few occasions, by a tube passed in front of the cerebellum from the opposite side into the cistern.

After due consideration, my conclusion is that the drainage and washing out above described follows the principles of treatment of a localised sepsis as nearly as possible in such a complicated region, and that my results might have been more satisfactory if the operation had been carried out at an earlier stage in the disease. I believe that the irrigation of the cerebro-spinal system advocated by Eagleton for the general "suppurative meningitis" (in which micro-organisms have been found by lumbar puncture) should be tried in this intermediate stage, which may be diagnosed by the methods described above, but I am convinced the irrigation should, if possible, be from the healthy to the diseased area.

The use of antiseptics in this region is admittedly not without danger, and may seem unreasonable; but even bearing in mind the recent work of Weed and others, I do not think this method of attack should be completely abandoned.

There are cases that must be regarded as being beyond surgical aid, and in this group, in my opinion, should be placed all those in which both the trabeculated sub-arachnoid region and the cisternæ have become involved, and a micro-organism found in the lumbar puncture fluid. Those familiar with the extent of the inflammation found in such cases on post-mortem examination must know that the probability of success from



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any surgical measure is very slight, unless some means can be found of rapidly and materially raising the resistance of the individual to the organism. I think it may be taken as proven that Haines' operation is not sufficient in such instances, and I believe that Sir Charles Ballance's suggested treatment would likewise prove a failure.

The *conclusions* arrived at from the study of this aspect of otitic meningitis are as follows:—

Firstly, we must endeavour to recognise lepto-meningitis at the early stage, when the infection is local (though this may be only for a very short period) and there is evidence of a region of maximum intensity of inflammation, since treatment at this stage has a fair chance of success. Secondly, there is an intermediate stage of the disease, the treatment of which is still a matter of investigation and experiment. Thirdly, there is a stage in which, without some great advance in internal therapeutics, the patient is beyond surgical aid.

Advance in the treatment of meningitis would, doubtless, be greatly facilitated if only it were arranged in each of our large hospitals that all cases of meningitis, from whatsoever cause arising, should be placed under the care of one team of observers, and not scattered throughout the hospital.

A detailed statement of five cases of lepto-meningitis successfully treated are reported in the *Journal of Laryngology and Otology*, 1922, pp. 354 *et seq.* Three additional cases are recorded here:—

CASE VI.—E. H., female, aged 40. Admitted 12.3.16. Discharge from right ear since early life; has long been giddy; headache for ten days; no vomiting. 16th—Temperature since admission, 100° to 102° F.; continuous occipital headache; head retraction; normal reflexes; papillitis in left eye; torpidity. Radical mastoid operation; cerebro-spinal fluid very turbid; mainly polymorphonuclears and some lymphocytes. Consequently, inferior labyrinthotomy and translabyrinth drainage; small escape of cerebro-spinal fluid. 17th—No improvement; slight flow of fluid; anaesthesia and lumbar puncture combined with lavage with normal saline and eusol; fluid passed freely through internal auditory meatus. Recovery.

CASE VII.—E. B., female, aged 17. Admission 1.4.14. Left ear discharged five to six years. During last two months twice brought home with "sickness and faintness." Three weeks ago, vomiting, pain at back of head and in left eye; stiffness in neck; never giddy. At 8.30 A.M., 1st April, found unconscious; she had been vomiting.

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On admission, very lethargic; winces with pressure upon left mastoid; abdominal reflexes present and equal; knee-jerks absent; left plantar extension; no papillitis; pulse 60 to 68.

Radical mastoid operation; cerebro-spinal fluid turbid; many polymorphonuclears; streptococci and short thick bacilli in films; temporo-sphenoidal lobe and cerebellum explored; lateral sinus normal; labyrinthotomy and translabyrinth drainage; turbid cerebro-spinal fluid. On 3rd, cessation of flow of fluid, and patient restless and vomiting. 5th—Flow re-established. Recovery.

Three other cases of meningitis in the cisterna pontis were treated similarly and recovered, but the records are incomplete.

CASE VIII. — R. C., male, aged 16. Admitted 21.3.22 with discharge from ears off and on since infancy; from the right ear for about three weeks; slight earache and headache on right side; no vertigo; R.T.M. inflamed and perforated; no mastoid tenderness. L.T.M. cicatrised; Weber to right; whisper reduced slightly on right side; no nystagmus; Schwartze operation on right side.

4.4.22—Patient groans and is irritable; constant right-sided headache, also frontal; no occipital pain; vomiting; photophobia; no vertigo or nystagmus; reflexes good and equal. Percussion is painful on right side of head. Lepto-meningitis over right temporo-sphenoidal lobe diagnosed.

Radical mastoid operation; cerebro-spinal fluid clear; total cells 48 per c.mm.; lymphocytes 84 per cent.; polymorphonuclears 10 per cent.; plasma cells 4 per cent.; chlorides 0.715; protein 0.03; sugar slightly diminished; no organisms in films.

Mastoid incision extended above forwards and backwards; bone removed from roof of middle ear and an extra-dural swab yielded a pure culture of streptococcus longus. Bone from roof of middle-ear cleft and outer surface of temporo-sphenoidal region was removed; area thoroughly cleansed and dura mater punctured with needle; from the fluid a pure culture of same organism grown.

A crucial incision was made in dura mater and pieces of arachnoid mater removed, and the parts swabbed with sterilised iodoform and lightly packed with gauze. Recovery.

## A NOTE ON BOILER-MAKERS' DEAFNESS.

By RICHARD LAKE.

THIS condition was so named because the first patients showing the peculiar series of symptoms about to be described were boiler-makers.

Boiler-makers are constantly riveting together plates of iron, working in the most appalling din and racket, hour after hour, while the intervals of rest are not sufficiently long to allow the tired organ to recover.

These workers very frequently become deaf, and their deafness has a well-marked peculiarity, viz., that they can hear comparatively well in the clash and crash of the shops.

The paracusis Willisii, in these cases, differs materially from that found in chronic progressive middle-ear deafness and otosclerosis; indeed, it is in reality a totally different reaction and should have a different title, viz., Paracusis Willisii Nervosa.

In testing patients suffering from this complaint, I found in most, if not all the cases which I have seen, a pronounced uniformity in the results of testing. Voice and whisper are very much diminished: Rinne with C (128 d.v.) is positive: bone conduction is reduced to one-third or less than normal, a totally different picture to that of progressive middle-ear deafness or otosclerosis.

### TUNING FORK TESTS.

#### *Boiler-Makers' Deafness.*

Bone conduction: much reduced.  
Air conduction: much reduced.  
Rinne's test C (128 d.v.): positive.  
Bing's test: positive.

#### *Progressive Middle-Ear Deafness, etc.*

Bone conduction: much increased.  
Air conduction: much reduced.  
Rinne's test C (128 d.v.): negative.  
Bing's test: negative.

It is worth mentioning that the confusion as to the interpretation of the symptom known as paracusis Willisii is partly due to the very obvious fact that, in the disease I am dealing with, the auditory nerve *is* stimulated by the noise. What seems to be the course of the affection is, that the end-organ of the auditory nerve is first irritated by the excessive noise and then gradually injured, eventually beyond repair. Doubtless, at first, and during the earlier stages of the malady, temporary recovery or partial recovery takes place when the sufferer is away from the

# Societies' Proceedings

noise, but the temporary improvements become gradually less until they entirely cease.

**Treatment.**—Preventative treatment is the only one of value, and this implies that all workers (especially those affected with boiler-makers' deafness) in noisy metal workers' shops should wear sound deadeners. I prefer "Aurotectors."

When that desired day arrives when the Ministry of Health can indulge in legislation for the protection of the various classes of workers, it is to be hoped that the "boiler-makers" will not be entirely forgotten.

## SOCIETIES' PROCEEDINGS

### ROYAL SOCIETY OF MEDICINE—SECTION OF OTOLOGY

February 16, 1923.

*Chairman*—Sir CHARLES BALLANCE, K.C.M.G., M.S.

**Otosclerosis and Osteitis Deformans: A Pathological and Clinical Comparison**—G. J. JENKINS, F.R.C.S.—The paper and the discussion will be published in the *Journal of Laryngology and Otology*, July 1923.

**Case of Necrosis of the Left Temporal Bone, involving Facial Nerve and Labyrinth, following Triple Infection of Scarlet Fever, Measles, and Diphtheria, in a Child aged 7**—J. F. O'MALLEY, F.R.C.S.—7th March 1922: Patient admitted to hospital with scarlet fever and measles (co-existent). Child has been ill four days. Temperature normal. (Under care of Dr W. J. J. Stewart, Medical Superintendent.) 14th March: Temperature 103° F. 15th March: Temperature 104° F. 16th March: Temperature 105° F. Apparently a very severe attack of measles. 22nd March: Nasal discharge and left otorrhœa; purulent conjunctivitis right eye; trace of albumin in urine. 23rd March: Throat inflamed; swabs from nose, throat and ear; positive to Klebs-Loeffler bacillus; 8000 units of antitoxin given twice on that day. 24th March: Redness behind left ear over mastoid; left facial paralysis: incision down to bone under general anæsthesia; no pus; wound packed and fomented; hearing normal (W. J. J. S.). 25th March: Temperature down to 100° F. Less nasal discharge. 28th March: Left facial paralysis continues; in mastoid wound large area of dead bone is seen; hearing impaired

# Royal Society of Medicine

left side. 29th March: Antrotomy; no pus in antrum or mastoid cells (W. J. J. S.).

1st April: Case seen by Mr O'Malley. Wound very unhealthy and not granulating; area of dead bone large and apparently affects whole of mastoid process. 13th May: Chicken-pox. 25th May: Swelling behind right ear: incision down to bone and pus evacuated under local anæsthesia; swab negative to Klebs-Loeffler bacillus (W. J. J. S.): healed uninterruptedly. 1st June: Floor of left mastoid wound occupied by dead bone. 15th July: Sequestrum of bone separated. 15th September: Large piece of bone separated; more dead bone in deeper parts. 7th December: Operation. There was a depressed irregular wound, scarred at the edges, with pus and dead bone in the centre; under general anæsthesia scarred edges resected and trimmed: dead bone removed; plastic of external meatus done and post-aural wound closed; drained through ear as in radical mastoid. 25th January 1923 (present state): Wound healed; slight discharge from ear occasionally; facial paralysis less apparent. Vestibular test: Cold caloric, no response; C<sub>2</sub> tuning-fork (right ear closed) not heard.

Mr O'MALLEY said that he had made inquiries about symptoms suggesting that the labyrinth was affected before he saw the case. The Medical Superintendent said there were several attacks of retching on the night of 24th/25th March, twenty-four hours after the onset of the mastoid condition; during the period of the mastoid condition the child was very ill, and could not swallow food, but was nourished with saline and glucose for ten days.

Mr MARK HOVELL said that for a long time past he had felt it greatly to be regretted that the disinfection of the naso-pharynx was not universally regarded as a routine treatment in cases of measles, scarlet fever, and some other infectious diseases. If this were systematically done, he believed it would prevent middle-ear complications in many cases. Disinfection was easily done by spraying collosol argentum through the nostrils.

Sir CHARLES BALLANCE (Chairman) said that he remembered having had diphtheria long ago, before the days of the antitoxin, even before the organism had been isolated; his nose had been sprayed with sulphurous acid, which was very unpleasant, but might have been effectual, as he had no mastoid or ear trouble afterwards and had made a good recovery.

## **Parotid Fistula in the Scar an Old Mastoid Wound—**

H. J. BANKS-DAVIS, M.B.—A woman, aged 23: has had operations on both mastoids. Two operations have been performed on the left side.

The secretion exudes from a pin-point depression at the lower end of the scar on the left side. The flow is periodic and "occurs when she is eating."

Mr Norman Patterson has shown a similar case—the condition is not uncommon.

## Abstracts

**Laceration of Meatus and Tympanic Membrane produced by a Celluloid Knitting Needle**—H. J. BANKS-DAVIS, M.B.—A woman, aged 40, with severe hæmorrhage, continued for several hours: the meatus had to be tightly plugged in order to arrest it. It was venous bleeding, and the question is: "What was the source?" Blood came down the Eustachian tube. The patient is well now, except for vertigo. It is unlikely that the jugular bulb was injured.

Mr J. F. O'MALLEY referred to a similar case of injury to the tympanic membrane, in which there were symptoms of the same kind, though the hæmorrhage was not so severe as in Mr Banks-Davis's case. There was, however, considerable vertigo. He (Mr O'Malley) had often wondered what was the pathological lesion which caused the vertigo.

Sir CHARLES BALLANCE (Chairman) said that he remembered the case of a nurse at St Thomas's Hospital, long ago, whose ear had been syringed by another nurse with a long-pointed syringe, which slipped and went through the tympanum, impinging on the inner wall. The patient fell down as if she had been shot, and had very severe vertigo for a long time; she could not resume duty for eighteen months.

## ABSTRACTS

### EAR.

*Beethoven's Deafness.* GEORGE CANUYT, Strasburg. (*Annales des Maladies de l'Oreille, du Larynx, du Nez, et du Pharynx*, January 1923.)

In a long and sympathetic article the writer tries to throw some light on this subject by an analysis of Beethoven's personal letters. He touches on the great musician's birth at Bonn in 1770, on his early life and achievements, and describes his characteristics. In 1796, at the age of 26, his ears began to be affected. Tinnitus constantly assailed him, day and night, but until 1800 he kept his affliction secret from even his dearest friends. After this period he sought solace and sympathy by writing to his friends of his trouble, but he became more and more of the recluse. Eventually he was forced to use artificial aids to hearing, and these are still preserved at Bonn. In fifteen years from the onset of his deafness, he was totally deaf. He died in 1827 of an abdominal complaint.

Autopsy revealed much ascites and a hobnailed liver. The pinnæ of the ears were large and irregularly formed, with deep and spacious external auditory meatuses. The Eustachian tubes were open, and

## Ear

the middle ear and mastoid process were more than usually vascular. The 8th nerve on each side was atrophied and the accompanying blood-vessels were sclerosed. The fourth ventricle at the root of the nerve was also hypervascular. The skull bones were very thick. Differential diagnosis between syphilis and otosclerosis is entered upon, the author concluding in favour of the latter.

Canuyt decides that the great man's genius as a composer, far from being hindered by his deafness, was greatly aided by his being cut off from his kind, allowing his art fully to be developed.

GAVIN YOUNG.

*Further Communication on the Symptom of Diminished Calcium-content of the Blood in Otosclerosis, and the Influence of Therapeutical Treatment.* HANS LEICHER, Frankfurt a. M. (*Zeitsch. f. Hals-, Nasen-, und Ohrenheilkunde*, Bd. IV., p. 74.)

In most cases of otosclerosis there is a small but definitely manifest diminution in the calcium-content of the blood serum, and in those in whom the calcium-content is not diminished a fall is brought about by the administration of primary (? neutral) phosphate of soda for one or two weeks which does not take place in normal subjects. Calcium diminution, especially when the ionised calcium is very defective, is accompanied clinically by symptoms of mechanical and electrical hyper-excitability and also by disturbances of the vegetative nerve-system, such as nervous stomachic and intestinal difficulties, heat of the head with coldness and moistness of the hands. The original causes appear to be disturbances of the internal secretions or constitutional anomalies. The occurrence of calcium deficiency suggests, as prophylactic measures, the avoidance of pregnancy, chills, sore throats and mental excitement, also the examination of the serum of the children of "otosclerotics." In regard to treatment a distinction is to be made between those in whom the fixed calcium is diminished (with absence of hyper-excitability) and those in whom the defect is in the ionised calcium (usually with Choostek's phenomenon of hyper-excitability). To raise the total calcium-content the writer recommends phosphorus for months or years, and homo- or hetero-plastic transplantation of the parathyroid. For deficiency in ionised calcium the same means are advised with, in addition, calcium by the mouth in the form of large doses of the chloride or (in case of tinnitus) the bromide, and by the veins the chloride or Afenil, or the bromide. Chloride or phosphate of ammonium and ammonium bromide are also recommended.

JAMES DUNDAS-GRANT.

## Abstracts

*Is Nystagmus from Caloric Weak and Strong Stimulation, induced Physically or Physiologically?* A. ECKERT, Jena. (*Zeitsch. f. Hals-, Nasen-, und Ohrenheilkunde*, Bd. II., p. 165.)

Kobrak's "weak-stimulation" consists in inducing nystagmus to the opposite side by syringing so small a quantity as 5 c.c. of cold water into the ear. After a varying reaction time (ten to thirty seconds from the beginning of the syringing) the nystagmus appears and lasts for a varying time (sixty to two hundred seconds). Kobrak considers the stimulus as less physical than physiological. Eckert, while attributing considerable interest and value to the weak stimulation, postulates that it must only be used along with other tests. He insists, in opposition to Kobrak, that the stimulus is essentially physical, and in support of this view refers to Maier and Lion's experimental proof of the movement of the endolymph in the semi-circular canals under adequate caloric stimulation.

JAMES DUNDAS-GRANT.

*Vaccine Treatment of Affections of the Eighth Nerve and its Terminals.* R. LEIDLER and E. STRANSKY. (*Wiener Klinische Wochenschrift*, 11th Jan. 1923.)

The authors comment on the large amount of work that has been done in vaccine-therapy, but the little in which it has been applied to the acoustic system, considering all the many conditions of the acoustic nerve of which Menière's syndrome is often an expression.

The authors have treated a series of fifteen cases with intramuscular injections of Dollkens' vaccine (a form of protein-body therapy). Of these, two were also given intravenous injections of a vaccine of typhoid bacilli starting with a dose of five millions.

Only non-acute cases were treated, and most of them were purely internal ear conditions, but two also had middle-ear catarrh. The dizziness was the first symptom to improve and did so rapidly. It completely disappeared in a third of the cases and markedly decreased in a further third. Tinnitus was much improved in most of the patients, but hearing was only improved in very few and even deteriorated in one or two.

F. C. ORMEROD.

*A Labyrinth Poison in Hair Dye (Paraphenylenediamine).* Dr PAUL LAURENS, Paris. (*Bulletin d'Oto-Rhino-Laryngologie*, July 1922.)

Dr Laurens draws attention to poisoning of the labyrinthine apparatus, both acute and chronic, due to paraphenylenediamine. This is a frequent constituent of hair dyes, usually described as "vegetable," and is known among barbers as "Para." Experiments on animals have shown its poisonous nature, and also that it is



## Ear

absorbed by the skin: it has apparently a selective action on the labyrinth.

Acute cases usually begin with vague giddiness, sometimes accompanied by nystagmus: tinnitus appears later and is incessant. In the chronic form the same symptoms occur, and gradual deafness ensues, such cases resembling closely classical otosclerosis. In a further group, arterio-sclerosis is associated with the use of the dye.

The author gives notes of eighteen cases. He remarks that this poison must not be forgotten when treating obscure cases of "toxic" labyrinthine disease. The condition improves slowly when the dyeing is stopped.

E. WATSON-WILLIAMS.

*Osteitis of the Temporal Bone, with Meningitis.* H. LAWSON WHALE.  
(*British Medical Journal*, 24th Feb. 1923.)

For ten days before the case was transferred to the surgeon's care, the classical signs of meningitis were present, with turbid cerebro-spinal fluid containing polymorphonuclear cells but no organisms.

Operation disclosed a perisinus abscess, sinus thrombosis, and an osteitis of the adjacent bone. The jugular vein was not ligated. The patient made a good recovery with slow improvement of a double optic neuritis which had been present from the beginning.

The reporter attributes to the use of bipp much of the credit for the good result.

T. RITCHIE RODGER.

*The Operative Treatment of Septic Meningitis.* H. L. MARTYN  
(*The Lancet*, 1923, Vol. i., p. 485.)

The author freely quotes Jenkins's paper at the Tenth Otological Congress in reporting the case of a woman, aged 37, with septic meningitis following acute influenzal middle-ear suppuration. The Schwartze operation was performed, the mastoid being of the cellular type. Symptoms of meningitis appeared about nineteen days later. Lumbar puncture showed fluid under pressure, but not turbid. The mastoid incision was then extended by a horizontal incision backwards and the flaps turned down. A wide area of bone was removed upwards and downwards and backwards from the mastoid cavity to expose the outer surface of the temporo-sphenoidal lobe, lateral sinus, and dura mater below the tentorium. The fluid in the posterior fossa was turbid. The dura was incised over the temporo-sphenoidal lobe, and below the horizontal part of the lateral sinus and a narrow spatula passed below and in front of the cerebellum to the cisterna pontis; this resulted in a free gush of cerebro-spinal fluid, turbid and under pressure. Gauze drains were inserted. Immediate improvement resulted and progress was uneventful. Lumbar puncture was repeated three days later.

MACLEOD YEARSLEY.

## Abstracts

### *Acute Meningitis of Otitic Origin, with Unusual Complications.*

J. D. DE LAMOTHE. (*Archives Internat. de Laryngologie*, January 1923.)

The author was called to see a case presenting all the features of a suppurative labyrinthitis with diffuse meningitis of otitic origin. The cerebro-spinal fluid was under tension, was turbid, and contained diplococci. A radical mastoid operation with labyrinthectomy (Neumann) was carried out. An abscess was evacuated in the situation of the saccus endolymphaticus.

On the seventh day after the operation a large portion of cerebral tissue herniated through the dura mater covering the temporal fossa. Lumbar puncture gave a clear cerebro-spinal fluid under low tension and sterile.

In spite of this complication the patient made good progress until the twenty-fourth day, when acute headache supervened, the temperature shot up to  $104^{\circ}$ , and the patient died.

The author ascribes the cause of death to acute encephalitis and draws attention to the following points:—

1. That the original septic meningitis was cured.
2. That this was probably due to the evacuation of the empyema of the saccus endolymphaticus.
3. That the subsidence of the meningeal phenomena does not necessarily indicate a favourable prognosis.
4. That the cause of the spontaneous perforation of the dura mater was unexplained.

M. VLASTO.

## NOSE AND ACCESSORY SINUSES.

*Trans-septal Suture in Operations for Ozæna.* Dr A. SEIFFERT, Berlin. (*Zeitsch. f. Hals-, Nasen-, und Ohrenheilkunde*, Bd. I., Heft. 1 and 2, 1922.)

After free opening and clearing out of both maxillary antra through the canine fossæ, a special needle is passed through the upper part of the inner wall of the left antrum and the septum till it enters the upper part of the right antrum; it has a hook at its point, and on to this a silk thread is looped, and one end of it pulled through; the needle is then re-introduced in the lower part of the inner wall of the left antrum and pushed through the septum and into the lower part of the right antrum, where the other end of the thread is looped on to the hook and drawn through into the left antrum. The two ends are then firmly tied together and cut short. They may be left *in situ* for several months if required. This does away with the necessity

## Peroral Endoscopy

for continuous plugging. With this operation can be combined the formation of the intra-antral fistula from the parotid, as devised by Lautenschläger and Wittmaack. JAMES DUNDAS-GRANT.

*Contribution to the Treatment of Ozaena.* G. SPIESS. (*Zeitsch. für Hals-, Nasen-, und Ohrenheilkunde*, Bd. IV., p. 273.)

This consists in taking blood fresh from the arm-veins and injecting under the mucosa (or perichondrium) of the turbinated bodies and septum. The blood forms a hæmatoma which is not readily absorbed and which assists in narrowing the lumen as well as stimulating the atrophied mucous membranes.

JAMES DUNDAS-GRANT.

*Maxillary Sinusitis in the New-Born.* By F. J. COLLET. (*Archives Internationales de Laryngologie*, November 1922.)

The author, taking one of his own cases as the text and reviewing a number of others, with references, describes the symptoms, prognosis, and treatment of the above condition.

He states that the maxillary antral infection is always secondary to an alveolar necrosis involving the dental follicles and leading to fistula formation in the alveolar margin.

Treatment should be carried out by incision through the alveolar process and never through the nose, taking care to work as medial as possible so as to avoid injury of the dental germ follicles not involved in the inflammatory process. M. VLASTO.

(*Note*.—Presumably this is the condition which is generally regarded as "Acute Osteomyelitis of the Maxilla in Infants."—ABS. ED.)

## PERORAL ENDOSCOPY.

*Paralysis of Œsophagus in Botulism.* G. WORMS and GAUD, Val de Grâce. (*Bulletin d'Oto-Rhino-Laryngologie*, Paris, January 1923.)

The authors record and illustrate a case of paralysis of the œsophagus occurring in a young soldier, suffering from botulism. Five days elapsed before onset of symptoms, and difficulty in swallowing solids was the first. Diplopia and constipation followed, then paralysis of ocular accommodation. The throat was very dry, but laryngoscopic appearance normal, without paralysis of palate or larynx. The œsophagus was flabby and quite inert. Bismuth paste spread uniformly all down the tube and remained there, showing only the bronchial indentation. Repeated gulps of water were required to wash the

## Abstracts

paste down. There was no spasm; bougies and tubes passed more readily than usual. The condition cleared up after two months.

E. WATSON-WILLIAMS.

*Foreign Bodies in the Air and Food Passages.* C. A. SCOTT RIDOUT, (*Brit. Med. Journ.*, 10th March 1923.)

Five cases are here reported, the first being half of a tooth plate in the right bronchus, the other half having passed through the intestinal tract. The patient was an epileptic.

The other cases were those of foreign bodies in the upper part of the œsophagus, viz., a drawing-pin, a mass of fish-bones, a meccano wheel and a tooth plate with pointed lateral extremities.

The last-named could not be removed by endoscopy and was extracted by external operation by an unusual route. The incision was made in the middle line of the neck, the thyroid isthmus divided and the left lobe of thyroid retracted, the œsophagus being entered on its antero-lateral aspect.

T. RITCHIE RODGER.

*Report on an Upholsterer's Tack in the Right Main Bronchus for Seven Years. Removal by Peroral Bronchoscopy. Drainage of Lung Abscess. Recovery.* J. D. KERNAN, New York. (*Laryngoscope*, Vol. xxxii., No. 2, p. 102.)

The patient's symptoms suggested tuberculosis, but no tubercle bacilli were found. Two X-ray examinations failed to assist diagnosis. Eventually hæmoptysis developed, and on being questioned the patient admitted having aspirated a foreign body seven years ago. Another X-ray examination revealed a shadow suggesting a tack, with its point upward, near the base of the right lung, close to the spine, and behind the heart shadow. On peroral bronchoscopy under local anæsthesia, the right bronchus was found to be almost occluded by granulation tissue. Forceps were introduced, the lumen dilated, and a 7-mm. tube pushed into an abscess cavity. Here the tack was found and removed. Operation lasted forty minutes. Hæmoptysis ceased and recovery followed.

ANDREW CAMPBELL.

*Combined Transpleural and Transperitoneal Resection of the Thoracic Œsophagus and the Cardia for Carcinoma.* CARL A. HEDBLUM, M.D., F.A.C.S., Rochester, Minnesota. (Section on Surgery, *Mayo Clinic*.)

In May 1922, Hedblom resected the thoracic œsophagus and the cardiac portion of the stomach for carcinoma. The patient, a male aged 52, survived, and a month later was reported to be taking food slowly by the mouth with the aid of an anastomotic tube. The

## Miscellaneous

operation was performed in two stages under local and nitrous-oxide-oxygen anæsthesia on both occasions.

*First Operation.*—Resection of the fifth to the eleventh ribs from the angle to the costal cartilage on both sides.

*Second Operation.*—An incision was made to the left of the middle line below the level of the costal cartilages and extending outward and upward to the level of the fourth rib in the mid-axillary line, and the pleural cavity was opened. The diaphragm was split down to the hiatus, and the pleura incised and opened: the right vagus was separated and the left divided. The lower portion of the œsophagus was mobilised, and it, together with the cardiac portion of the stomach, was resected by the actual cautery. The stomach was closed off and brought into the lower part of the wound and opened a few days later. The œsophageal stump was sutured to the depressed skin edges and the skin closed over, with drainage. Subsequently the two fistulous openings were joined by a rubber tube during feeding.

In discussing the case the author draws attention to the impossibility of bringing the divided upper end of the œsophagus down to the stomach and notes that all recorded cases of an attempted end-to-end anastomosis have failed. He also notes the difficulty in mobilising and resecting the œsophagus sufficiently to bring it out through the skin, but fortunately the vascular supply was sufficient to maintain its nutrition in this case.

The article is completed by a good bibliography.

E. MUSGRAVE WOODMAN.

## MISCELLANEOUS.

*A Feather in the Parotid Duct.* Sir J. DUNDAS-GRANT, K.B.E., M.D.  
(*Brit. Med. Journ.*, 10th March 1923.)

The patient, a small child, had a large painful swelling in the right parotid region, and could not open the mouth. The tip of a feather, presumably from the child's pillow, was found protruding from Steno's duct. The feather, when removed, was an inch long. The abscess was incised, and healing took place quickly.

T. RITCHIE RODGER.

*Dental Cysts of the Mandible.* By Dr JACQUES, Nancy. (*Annales des Maladies de l'Oreille, du Larynx, du Nez, et du Pharynx*, January 1923.)

The type of cyst is benign and fluid-containing, and develops in the body of the mandible in connection with a tooth. There are two types, showing different relations to the teeth; one is associated

## Abstracts

with a diseased tooth and is the product of inflammation, being in relation originally to the root. The other is formed at first on the crown of a sound tooth, and is the result of a developmental error. Clinically the types are indistinguishable. Less than 5 per cent. of all dental cysts seen by Jacques were in the mandible.

Treatment consists in evacuating the cyst contents along with the lining membrane. In the case of cysts of small or medium size, a certain amount of the surrounding bone is also removed. Where the cyst is large, æsthetic considerations arise, and due care is taken to preserve as much of the bony framework as is possible. Operation in these cases consists in an intrabuccal incision over the salient part of the swelling, removal of sufficient bone to evacuate the contents, puncture through the most dependent part of the cavity into the subgenial region, and closure of the buccal opening. Good results are said to be obtained in from one to three months. Two typical cases are instanced.

GAVIN YOUNG.

*An Experiment in Graduate Training in Oto-Laryngology.* By GEORGE E. SHAMBAUGH, M.D., Chicago. (*Journ. Amer. Med. Assoc.*, Vol. lxxix., p. 5, 29th July 1922.)

The writer outlines the preliminary training in Oto-Laryngology which is given at the Rush Medical College to students who desire to take up this specialty. The course lasts one year, and the student is then advised to take an appointment as *interne* at a special hospital. Facilities are offered to him to do work at the University of Chicago in the afternoons, on the subjects anatomy, physiology, pathology, etc. It is suggested that the other Class A Medical Colleges should take up the training of specialists and grant a degree to show that these men have completed a definite training in Oto-Laryngology.

PERRY G. GOLDSMITH.

## REVIEWS OF BOOKS

*The Cure of the Deaf.* J. L. AYMARD, M.R.C.S., L.R.C.P.

It has been the reviewer's task to investigate many methods, claimed by their authors to be generally effective in the cure of the deaf.

Of these methods some were confined to the drum-head, others were stated to re-educate the hearing faculty, while others again acted as medicinal treatment. Practically all the authors dealt with deafness generally, including in their embrace labyrinthine or nerve lesions, oto-sclerosis and suppurative or catarrhal otitis media, which fact at once established a weak chain in their armour, for it is impossible to imagine any one method coping effectually with such widely divergent conditions.

It was therefore with much interest that the above book concerning the cure of catarrhal deafness, which he states (perhaps correctly) to include 80 per cent. of all cases was read, and the author's claim carefully looked into.

Firstly—Dr Aymard has far from advanced his cause by his unfortunate "Preface." His general statement as to the "out-of-datedness" of other aurists—his own wide claim that "the deaf hitherto pronounced incurable" can now be cured—his objection to any other aurist claiming only to check the progress—and his bluntly stated reasons, implying bad work and knowledge as the reason of the supposed cloud under which the specialty is at present dwelling—all savour of familiar advertising phrases, not usually associated with genuine scientific investigation.

It is a pity, because his "apéritif" rather spoils the mind for many excellent ideas to follow.

Secondly—The author cannot, nor do I think he does, claim any originality for seeking in the nose and naso-pharynx the seat of the causal factor in these cases of deafness. Any aurist who has had charge of a children's clinic can easily speak of the great drop in the number of discharging ears, since the compulsory removal of enlarged tonsils and adenoids came into force in the London County Council Schools. Again, many investigators have published their opinions as to the necessity of preventing all nasal and post-nasal catarrhs, and the removal of any causal factors.

Thirdly—The main interest of the book lies in the author's treatment of the naso-aural catarrhs. Many have had experience, with more or less success, of ionisation and high frequency, but to the reviewer, at least, the method of electro-aeration is new. The author combines these three types of electrical treatment as required,

## Reviews of Books

and has obtained results that can only be termed remarkable. Both nose and ear are thus treated separately or together, and 60 per cent. of "very good" results are claimed in 50 consecutive cases, while tinnitus is said to be cured in all cases.

The reader must refer to the book for a description of the careful technique and electrical apparatus.

The best results are obtained in younger people, many of whom are said to have been given up as hopeless by other specialists.

Operative treatment such as submucous resection and tonsillectomy, where necessary, are combined with the electrical.

Fourthly—The following strong points are made:—(1) The necessity of *complete* removal of tonsils and adenoids. (2) Thorough removal of the septal deformity without leaving a flapping septum. (3) Non-interference with the turbinates. (4) The constant presence of organisms in the middle ear and Eustachian tubes as well as the nasal cavities. (5) The uselessness and danger of the Eustachian catheter. (6) The benefit of physical exercise. (7) The fact that in bathing the infection is via the tube and middle ear and not the meatus. (8) The necessity of good drainage in all suppurative cases. (9) Complete mastoidectomy is rendered seldom necessary.

Finally—The method deserves to be given a thorough trial in spite of the manner of the book, in order to ascertain the full value to be given to the word "Cure."

FRANCIS MUECKE, C.B.E., F.R.C.S.

*The Voice Beautiful in Speech and Song.* ERNEST G. WHITE.

Third Edition. Dent & Sons, London, 1922.

Mr Ernest G. White in his book entitled *The Voice Beautiful* sets out "to show and, if possible, to convince the world in general that the vocal cords are not the seat of sound, but that the whole compass of the human voice is divided between four sets of sinuses which are found on each side of the head."

The book is a most interesting and comprehensive study of the voice, and will be valued as an important contribution to the literature of this subject. Many examples are given to prove the impossibility of the cords being used save as breath controllers; in accordance with this conception, most interesting explanations are offered for the so-called "breaking" of the boy's voice, and also for cases where the loss of voice, due to removal of part or whole of the cords, has been followed by a more or less complete degree of recovery.

He refers on page 75 to cases under Dr Harmer, in which, after operation involving even complete removal of the vocal cords, there has been recovery of surprisingly good voice production.



## Letter to the Editors

The author shows that the temporary loss of voice, following on such operations, is due to a lack of power to direct the breath to the head sinuses, and that this can be remedied by practice.

Mr White analyses the whole process of voice production in speaking and singing, and endeavours to show how the conception of the function of the cords and sinuses, which he adopts, provides the true interpretation. Hitherto the production of sound has been ascribed to the vibration of the cords, modified and re-enforced by the various sinus resonators. Mr White regards the sinuses as the seat of sound production, but it is still not quite clear from his account of the matter that the sound is produced in the absence of any vibrating mechanism like the cords. The vibrations according to him are caused by the tortuous passages and sinuses through which the air travels.

Whatever may be the final result of investigation, it must be admitted that the author has produced a mass of facts and suggestions which are well worthy of the most careful consideration of all teachers of voice production.

M. L. S.

## LETTER TO THE EDITORS.

TO THE EDITORS,

*The Journal of Laryngology and Otology.*

SIRS,—Mr T. A. MacGibbon, in the *Journal* of October 1922, says that if he could be sure of obtaining the same results with the immediate closure of the mastoid wound, as with the older method of completing the Schwartze operation, he would willingly adopt it.

He need not fear to do so. It is certainly one of the greatest advances in aural surgery; in fact, it makes the operation almost uninteresting. The use of B.I.P.P. and the blood-clot will not give the excellent result if infected cells are left, and failure may result if too much B.I.P.P. is used.

Let Mr MacGibbon follow out accurately Mr Tilley's technique and apply B.I.P.P. to his sutures and he will not have even stitch abscesses. Practically all his after-treatment will consist in putting on a clean bandage for the sake of appearances, and in taking out the sutures in a week or so. He will be impressed with the remarkable way in which the middle ear clears up, while the patient is saved all the torment of the after-dressing.

H. J. GRAY.

PERTH, WESTERN AUSTRALIA.

## GENERAL NOTES

SUMMER MEETING OF THE SECTION OF LARYNGOLOGY,  
ROYAL SOCIETY OF MEDICINE, MANCHESTER, 15th and 16th June 1923.

The Annual Summer Meeting of the Section will be held at Manchester on Friday and Saturday, 15th and 16th June.

The Sessions will commence each day at 10 A.M. at the Royal Infirmary. The forenoon of Friday will be devoted to the reading and discussion of papers. At 1.15 o'clock, the local members of the Section will entertain the visitors to luncheon in the Medical Board Room of the Royal Infirmary.

The afternoon Session, commencing at 2.45 o'clock, will be held in the Out-Patients' Hall, where cases will be examined and subsequently will be discussed in the Lecture Theatre.

Tea will be served in the Medical Board Room.

The *Annual Dinner* of the Section will take place on Friday evening.

At the Saturday morning Session, further papers will be read.

\* \* \*

SUMMER MEETING OF THE SECTION OF OTOTOLOGY,  
ROYAL SOCIETY OF MEDICINE, CAMBRIDGE, 29th and 30th June 1923.

The Summer Meeting will be held at Cambridge on Friday and Saturday, 29th and 30th June. Through the courtesy of the Master of Gonville and Caius College, accommodation will be provided in the buildings of the College.

The work of the Section will be devoted mainly to the physiology of the auditory apparatus, and papers will be read upon The Functions of the Labyrinth and, if possible, practical demonstrations will be given by physiologists and otologists attending the Meeting.

\* \* \*

BRITISH MEDICAL ASSOCIATION, PORTSMOUTH, 1923.

The Ninety-first Annual Meeting of the British Medical Association will be held at Portsmouth from the 24th to the 27th July inclusive, and will be presided over by Mr Charles P. Childe, F.R.C.S., Senior Surgeon to the Royal Portsmouth Hospital.

The Sectional Meetings are arranged for the 25th, 26th, and 27th. The Sections of Laryngology and Otology have been combined and placed in the two-day Sections.

The following Office-Bearers have been elected :—*President*—Mr Ernest B. Waggett, D.S.O., London. *Vice-Presidents*—Mr Somerville Hastings, London ; Mr A. J. M. Wright, Bristol. *Hon. Secretaries*—Mr H. Bedford Russell, 86 Harley Street, London, W.1 ; Mr George H. Ross, 28 Kent Road, Southsea.

The following two Discussions have been arranged : "Spasm of the Larynx," to be opened by Sir St Clair Thomson, and "The Non-Suppurative Affections of the Labyrinth," to be introduced by Mr Sydney Scott.

Original papers are invited from members of the Association.

# General Notes

THE LATE CHARLES EDWARD BEAN, M.R.C.S. Eng., F.R.C.S. Ed.

The death of Mr C. E. Bean, at the age of sixty-nine, deprives the West of England of one of its leading aural surgeons and laryngologists.

Born on the 27th December 1853, he studied medicine at Guy's Hospital. Qualifying in 1883, he took, in 1892, the F.R.C.S. (Edinburgh). In 1884, he began practice at Plymouth, commencing as a general practitioner, but he soon concentrated his energies in the special branch of ear and throat work. In 1886, along with Mr George Jackson, F.R.C.S., he founded the Devon and Cornwall Ear and Throat Hospital, which became the centre of his work for many years : indeed, it was only two years ago that he gave up active work in it, and became consulting surgeon and Vice-President of the Institution.

Mr Bean was President of the Plymouth Medical Society in 1905, and in 1907, he was one of the Vice-Presidents of the Section of Laryngology and Otology, at the Exeter Meeting of the British Medical Association. He was careful at all times to keep himself abreast of medical progress, and he attended the meetings of the Section of Laryngology of the Royal Society of Medicine as regularly as his work would allow.

His interests were not by any means confined to the narrow sphere of his special work. He had very considerable knowledge of diseases of the eye, and it is possible that he would have preferred to practise that department of work, had circumstances permitted it. His knowledge of chemistry gave him the post of Public Analyst of Plymouth, which he held till within two years of his death. He was greatly interested in music, though not himself an exponent, and for many years was President of the Plymouth Musical Society.

Mr Bean had a keen and genial sense of humour ; his bluff and often pungent comments on men and things might stir up an occasional breeze, but they never caused him to lose a friend. Everyone liked him, even the medical officer of whom Mr Bean once enquired "whether it was professional incompetence or a mere desire to make himself a nuisance" that had led him to send certain cases to the hospital.

Some years before his death Mr Bean gave up his house in Plymouth, and went to live at Whitchurch on the edge of Dartmoor, whence he came in daily to his practice. It was there that he suffered from the stroke of apoplexy which cut short his busy and happy life.

He leaves a widow and a son and daughter to whom we tender our sincere sympathy. His elder son, who had entered the Army, fell in the late war with Germany.

C. R. CROWTHER.

\* \* \*

## LARYNGOLOGY IN CHINA.

We have received the following notes from Dr W. S. Thacker-Neville, F.R.C.S.E. :—

In February 1923, the first meeting of laryngologists to be held in China took place at Shanghai. A Section of Laryngology had been formed as one of the constituent parts of the China Medical Missionary Association. The Section was presided over by Dr Thacker-Neville, who contributed a paper upon the routine work of Laryngologists in China.

## General Notes

Dr Slack, Assistant Professor at The Johns Hopkins Hospital, Baltimore, and acting temporary Professor at Peking, made two contributions, one upon the Indications for Tonsillectomy, and the other upon the Relations of Accessory Sinus Disease to Retro-bulbar Neuritis. Dr Han of Shanghai discussed the advantages of Local Anaesthesia in Operations upon the Tonsil, and Dr Digby of Hong Kong, who was prevented by illness from attending the Meeting, sent a communication upon the Indications for Tonsillectomy.

A paper upon the Early Signs of Tubercular Disease, which is one of the commonest laryngeal affections in China, was read by Dr Liu of Peking, while Dr Dilley of Cheefoo contributed an article upon the Advantages of Mosher's Operation of Ethmoidectomy. As ethmoidal disease is of very frequent occurrence, the paper was much appreciated.

A census of laryngologists showed that there were thirteen in the various Missionary Hospitals. Of these, eight are Americans, three are Chinese, and two are British. A programme of Clinical Research, which will be carried out during the two years which will elapse before the next Conference, was drawn up by the members of the Section.

We desire to congratulate our confrères in China upon the success of their Meeting and upon their arrangements for promoting Clinical Research.

\* \* \*

We regret to have to record the death, on the 16th April, of James Coubro Potter, M.D., F.R.C.S.E. An obituary notice of the deceased will appear in the next issue of the *Journal*.

\* \* \*

At the invitation of the President and Members of the Section of Laryngology and Otology of the Swedish Medical Society, Sir St Clair Thomson, Dr A. Brown Kelly, Mr Arthur H. Cheate, Dr William Hill, and Dr A. Logan Turner attended the Whitsuntide Meeting of the Section and contributed to its scientific business.

\* \* \*

### “QUERIES AND ANSWERS.”

The suggestion has been made that it might prove useful to our readers, if an opportunity was afforded them, through the pages of the *Journal*, of asking for information regarding points of doubt or difficulty, which may, from time to time, arise in connection with their work.

It is proposed, therefore, to open a correspondence column, under the above title, and to take the necessary steps to supply the information that may be desired.

# The Journal of Laryngology and Otology

(Founded in 1887 by MORELL MACKENZIE and NORRIS WOLFENDEN)

## A RADICAL FRONTAL SINUS OPERATION.

By WALTER G. HOWARTH, M.A., M.B. (Camb.), F.R.C.S. Eng., Surgeon  
to the Throat and Nose Department, St Thomas's Hospital.

SINCE I drew attention, some two years ago, to the operation that I employ for the treatment of Chronic Frontal Sinus Suppuration,\* I have received many requests from Surgeons in this country and in America that I should describe the procedure in fuller detail than the limits of my previous paper permitted. I am glad to do so, since a further two years' experience of the operation and of its results confirms me in the belief that it is a useful one.

It may be well to recall the objections that were brought forward to the two operations commonly in use, namely the Killian operation and the Ogston-Luc operation.

In the Killian operation an attempt is made to obliterate the sinus by removing part of the anterior wall and the floor of the sinus. This may be successful in some cases, but, in many others, it is not possible completely to obliterate the sinus, and "dead spaces" are apt to occur behind the bridge, along the ethmoid and elsewhere, which may give rise to considerable further trouble. The Ogston-Luc operation, whilst improving the drainage of the sinus somewhat, cannot ensure a thorough removal of the ethmoid.

It is my belief that chronic suppuration in the frontal sinus is indissolubly bound up with suppuration in the ethmoid, so that I now regard the ethmoid as the key to the frontal sinus. Consequently, a satisfactory frontal sinus operation should allow for the possibility of the complete removal of the ethmoid cells.

\* *Journal of Laryngology and Otology*, September 1921.

## Walter G. Howarth

As it does not seem possible to obliterate the sinus, the alternative would appear to be some procedure whereby the main cavity can be completely and permanently drained into the nose.

I think that the operation that I have now used in over two hundred cases fulfils these requirements.

A curved incision (Fig. 1) is made just under the supra-orbital margin and brought down in front of the inner canthus on to the side of the nose. The skin being very thin in this region, a fine scar is obtained; moreover, as it is in this situation that the shadow falls, often the scar is almost invisible. The incision is carried down to the periosteum; bleeding from the numerous branches of the angular vein is usually very free, but is readily controlled.

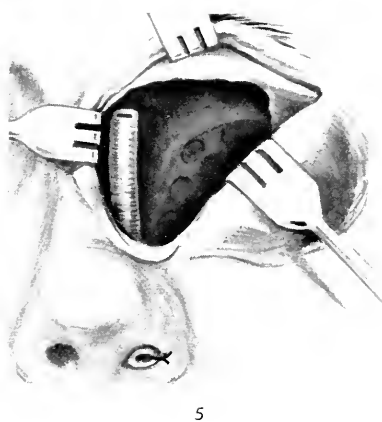
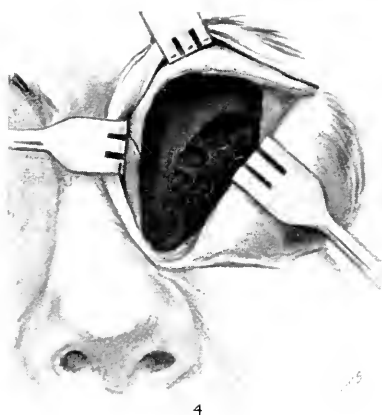
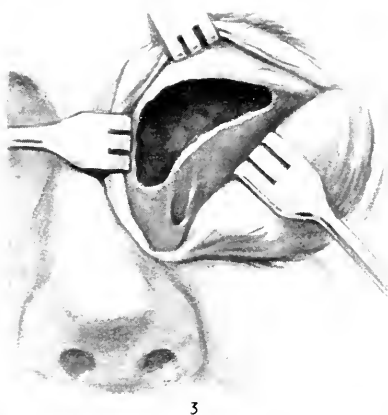
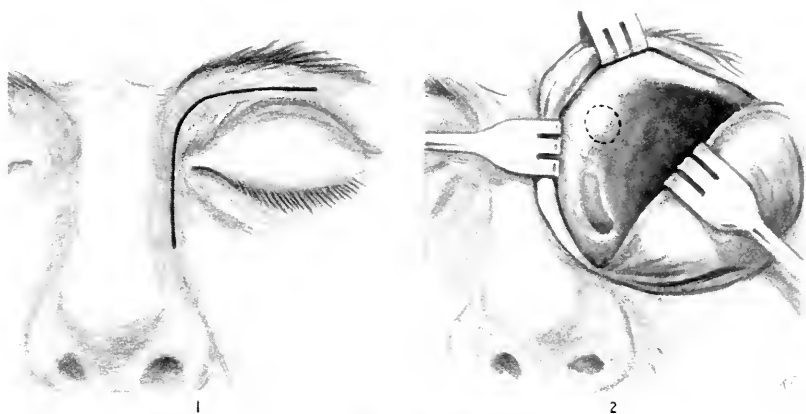
The periosteum is incised in practically the same line as the skin incision, and, with a Farabœuf's rugine or other suitable instrument, the periosteum covering the roof and inner wall of the orbit is then raised; the pulley of the superior oblique is thus detached from its notch and the whole of the orbital contents displaced outwards; similarly, the lachrymal sac is displaced from its groove and retracted outwards with the orbital contents. The appearance is then somewhat as is depicted in Fig. 2.

The sinus is now opened in the situation where one is always sure to find it (dotted circle in Fig. 2), just above the lachrymal groove.

With a Citelli's bone forceps the whole of the floor of the sinus is now removed right up to the supraorbital margin. If long shallow galleries are seen to project backwards in the roof of the orbit or outwards towards the external angular process, their floor is usually thin and may be completely removed with a strong pair of Luc's forceps.

The lining mucosa should be disturbed as little as possible. The portion lining the floor of the sinus will, of course, be removed with the bone, but that which lines the dome of the cavity should be left intact.

Attention is now turned to the region of the fronto-nasal duct. A copper bougie is, if possible, pushed up it from the nose to act as a guide. With the Citelli forceps the bone in front of the fronto-nasal duct (that is to say, part of the ascending process of the superior maxilla) is removed, so that the appearance is as in Fig. 3, and the operator is in a position to see







## A Radical Frontal Sinus Operation

whether any ethmoidal cells are mounding up into the floor of the frontal sinus or overlying the fronto-nasal duct.

The ethmoid is then attacked, entrance being effected through the lachrymal groove. After the anterior cells have been removed it will probably be found satisfactory to employ a bimanual method, the ethmoidal cells being broken upwards from below by means of a mastoid curette applied intranasally, the debris being removed through the external wound with a Luc's forceps held in the other hand.

The ethmoid cells are followed backwards if necessary to the sphenoid. Often a series, stuck like barnacles to the base of the skull, may require careful opening, and it is sometimes a matter of considerable difficulty to decide whether one has really reached the base of the skull or whether another flat ethmoidal cell still intervenes. The picture will then be somewhat as in Fig. 4.

An important part of the operation still remains to be done. This consists in making a new fronto-nasal duct further forward than the old one. In order to effect this, further portions of the ascending process of the superior maxilla and of the nasal process of the frontal bone must be removed with gouge and forceps, particular attention being paid to the boss which projects backwards from the frontal bone.

A large firm-walled rubber drainage tube pushed up the nose will lie well forward, as in Fig. 5. The upper end is tucked into the anterior part of the sinus and the lower end stitched to the ala of the nose. The orbital contents are then allowed to fall back into place, and the incision completely sutured with the finest silk-worm gut. The tube is removed at the end of ten days.

# OSTEITIS DEFORMANS AND OTOSCLEROSIS.\*

## A PATHOLOGICAL AND CLINICAL COMPARISON.

By G. J. JENKINS.

FOR some years I have been interested in the deafness found in patients who have Osteitis Deformans affecting the skull. During this period I have not been able to obtain sufficiently accurate clinical and pathological material to allow me to make the investigation entirely to my satisfaction, but perhaps this incomplete study may be useful to others. It is such a hope that supports me in reading this paper.

The subject may be considered under the following headings:—

- (1) A comparison of the Pathological Changes occurring in bone in Osteitis Deformans and Otosclerosis respectively.
- (2) A comparison of the Clinical Aspects of Osteitis Deformans with those of Otosclerosis.
- (3) Conclusions.

### **Pathological Changes in Osteitis Deformans and Otosclerosis.**

The microscopic sections about to be demonstrated are selected from serial sections of the temporal bones of three subjects, two of them cases of Osteitis Deformans, and one of Otosclerosis.

I regret that the clinical records of these cases are so unsatisfactory, but perhaps for our present purpose this is not so important.

The 1st series of microscopic sections are from the temporal bone of a female, aged 84 years, with cephalic Osteitis Deformans. She was very deaf. The 2nd series from the temporal bone of a male, aged 61, with Osteitis Deformans of the skull and long bones; and the 3rd series from a male, aged 41. In this case, deafness beginning in early boyhood became gradually worse. Tinnitus since onset; the patient was very deaf. The diagnosis of Otosclerosis was made.

\* A Paper read at the Section of Otology, Royal Society of Medicine, 16th February, 1923.

# Osteitis Deformans and Otosclerosis

This series was selected because it showed the general affection of the capsule of the labyrinth.

The specimens were hardened in 10 per cent. solution of formalin, and decalcified in formalin and nitric acid mixture (5 per cent. of each). The 1st and 3rd series were imbedded in celloidin and the 2nd in paraffin.

Sections of the clavicle and tibia prepared by Dr Perdeau will be demonstrated to show that the changes found in the temporal bone are the same as those in the long bones in Osteitis Deformans.

The most obvious feature in the microscopic appearance of the affected bone in both diseases is the Osteoporosis, which affords the important point of similarity.

In these specimens the trabeculæ of bone in Osteitis Deformans are somewhat coarser and the bone lamellæ more distinct than in Otosclerosis. In some parts, the bone has almost entirely disappeared in both diseases.

The sharply defined limits of the Osteoporosis is readily seen in Otosclerosis, but in Osteitis Deformans it can only be detected by a careful search. The dense bony capsule of the labyrinth seems to afford most resistance to the progress of Osteitis Deformans, as it is only in this part that I am able to detect the limitation, which is always indefinite in this disease.

The large osteoclasts, very obvious in all the sections, are more numerous in Otosclerosis. The proliferation of fibroblasts is more evident in that affection, but the fibrous tissue is a more prominent feature in Osteitis Deformans. Here and there, the large spaces in the affected part are in intimate relation to the endosteum. In both diseases, the irregular outline and denser staining of the bone in relation to the endosteum indicate new bone formation and an invasion of the labyrinthine space. In the 3rd series of sections of one of the cases of Osteitis Deformans the space has been encroached upon to a considerable degree.

In both Osteitis Deformans and Otosclerosis, in the specimens imbedded in celloidin there is a deposit of probably fibrinous material (Gram-positive) in the perilymphatic space.

The stapes is not affected by the disease in either case of Osteitis Deformans, and is apparently free.

The microscopic appearances are the same in sections of long bones and skull bones.

# G. J. Jenkins

## Clinical Aspects.

Before entering upon a comparison, let me attempt to define, firstly, what is meant clinically by "Otosclerosis," and secondly, what I mean when I use the expression "Otosclerosis Group." I need not detail the text-book description of "Otosclerosis," but perhaps it is advisable to draw attention to certain features that have seemed to me important.

*The Rinne Test*\* in typical Otosclerosis is, in my opinion, of first importance. A negative Rinne to low tones (say below 200) is one of the earliest definite signs. As the disease progresses, the "Negative Rinne Limit" becomes higher, until it may reach the highest tones of the Edelman series of forks.

This is also the case in middle ear deafness, but there is an important difference, in that the Rinne is negative with a much slighter degree of deafness in Otosclerosis than in any form of obstructive deafness.

*Bone Conduction* is usually, if not always, diminished in Otosclerosis. This is more evident with low than with high tones, but may be found only with low tones.

The Low Tone Limit is always raised in typical Otosclerosis, whereas the High Tone Limit is only very slightly affected.

*Hearing to Conversational Voice and Whisper.*—Firstly, in Otosclerosis, the distance between the point at which the patient hears the voice and that at which he can distinguish the words spoken, is much greater than in middle or internal ear deafness. Secondly, when the voice test is properly done, it will be found that in Otosclerosis there is very little difference between the distances for hearing spoken and whispered words, whereas in internal ear deafness there is a great difference, and in middle ear deafness there is an intermediate difference.

Typical Otosclerosis cases hear better with electrical aids; this is often a useful test.

The study of Otosclerosis has led me to believe that the symptoms and signs of typical cases are due to the site of activity of a disease which can produce other forms of deafness, if it occurs in other parts of the labyrinth. Otosclerosis as is ordinarily understood, is but one of the several forms of deafness that may be produced by the same disease.

Although this paper is not primarily concerned with

\* In testing all patients it is my practice to use Edelman's forks and whistles, and the monochord.

## Osteitis Deformans and Otosclerosis

Otosclerosis, it is, however, necessary briefly to consider what are the other types of deafness of this group, as, until this has been done, it will be impossible to attach a proper value to the various features of the deafness of Osteitis Deformans.

The few cases of Otosclerosis which I have been able to study from the very onset of the disease have begun as cases of pure internal ear deafness.\* These patients consulted me for the most part, because other members of the family were very deaf, and they wished to know whether or not they were themselves affected. In one instance, the patient came on account of tinnitus with a history of deafness in her family.

Miss B., aged 18. A sister had advanced "Otosclerosis" in both ears; a brother had unilateral Otosclerosis. The patient's tympanic membranes showed opacities. There was a slight degree of loss of bone conduction. Other signs and symptoms were absent.

About a year later, Weber to left side. Rinne: right, positive to all tones; left, negative to 190 d.v. Bone conduction was diminished in both ears. High tone limit was good. Low tone limit was slightly raised in both ears. Conversational voice: right, 24 ft.; left, 12 ft. Whisper: right, 18 ft.; left, 9 ft.

About two years later—typical advanced Otosclerosis was found in both ears.

Miss F., aged 19 years, came on account of tinnitus, and because there was deafness in the family. Tinnitus of humming character; whistling sound for two years. Deafness was not noticed. Her mother was deaf, with tinnitus; her uncle, on mother's side, was deaf. There was no history of middle ear inflammation at any time. Tympanic membranes showed opacities. Weber was to the right side. Rinne positive in both to all tones. Bone conduction diminished in both—fifteen seconds. High tone limit good. Low tone limit ? slightly raised. Conversational voice: right, 24 ft.; left, 24 ft. Whisper: right, 24 ft.; left, 24 ft.

Eighteen months later there was typical "Otosclerosis" in both ears.

It is not uncommon to find typical Otosclerosis in one ear, and only loss of bone conduction in the other.

Moreover, a patient with intimate family relations affected with typical Otosclerosis, may herself have internal ear deafness.

Mrs B., the mother of three children, with advanced Otosclerosis. The members of her family of her own generation were deaf. She

\* Mr Cheatle informs me that Laidlaw Purvis held this view.

## G. J. Jenkins

had tinnitus at times in the right ear, with considerable loss of bone conduction in both ears. There was marked deafness in the right ear; Rinne positive to all tones, but no note on low tone limit was made.

Miss E. complained of slight deafness. She was probably anxious on account of a strong family history of Otosclerosis. A brother had advanced Otosclerosis in both ears, and a sister had unilateral Otosclerosis.

All that could be found was slight loss of bone conduction in both ears. No deafness could be detected by testing with conversational voice or whisper.

We are all familiar with that form of deafness in which the symptoms and signs of "Internal Ear Deafness" and "Otosclerosis" are mixed in varying proportions.

Although this is a subject of vast extent, I hope that I have been able sufficiently to indicate the way in which I have come to look upon Otosclerosis as an accident of disease rather than a disease *sui generis*, and to regard it as one only of the many forms of deafness that may be due to a common pathological process.

For the present I propose to speak of these forms of deafness as the deafness of the "Otosclerosis group."

**The Deafness associated with Osteitis Deformans.**— I have found in all cases of Osteitis Deformans, in which the skull bones were affected to a marked degree, that the patients were invariably deaf. The difficulties of a study of this deafness must be obvious when it is remembered that most of the patients were old, and that often the mental condition was not sufficiently good to allow of a really detailed examination.

The following are notes of nine cases of deafness associated with Osteitis Deformans. One, H. A. (Case VI.), is described by Dr Stebbing as "very probably a case of early Osteitis Deformans." There is very little doubt in my mind, and I think very little in Dr Stebbing's, that this is a case of Osteitis Deformans, but it is impossible to be sure of the disease in the early stage.

CASE I.—A. C., female, aged 62. Operation by Sir Watson Cheyne, May 1894. Swelling about 3 in. long, behind the malar bone, slightly pushing up inferior wall of orbit. The right alveolus greatly affected. Tears overflow. At operation, bony tumour of anterior wall of antrum was removed. Deafness: right ear, gradually progressive for thirty years; left ear, five years gradually progressive.

## Osteitis Deformans and Otosclerosis

Paracusis very definite; no deafness in family. No earache, but present in childhood. No ear discharge at any time. Tinnitus, rumbling at times. Vertigo absent; headache absent. Lump in cheek began at age of 15; spread along right zygoma. No increase in size of head, and no changes in limbs or body noticed by patient. Radiograph of the head shows bone changes typical of osteitis deformans. Weber to right side. Rinne negative to all tones in both ears. Bone conduction diminished 5 to 10 seconds in both ears. High tone limit slightly down in both. Low tone limit raised to about 190 d.v. in both. Conversational voice: right, 2 in.; left,  $1\frac{1}{2}$  ft. Whisper: right, 1 in.; left,  $1\frac{1}{2}$  ft. After inflation, slight improvement in hearing. Hears much better with electric aid. Paracusis test +.

CASE II.—W. P., male, aged 64. Mental condition fairly good. Deafness one and a half years, gradually worse; thinks he hears better when in a very noisy place; no history of deafness in the family; no earache at any time; never had discharge. No tinnitus; no vertigo; no headache. Weber to left side. Bone conduction slightly diminished in both. Rinne negative to tones below about 190 d.v.; more definitely so in left than in right ear. Low tone limit raised in both ears to about 190 d.v. High tone limit down in both. Conversational voice: right, 3 ft.; left, 2 ft. Whisper: right, 2 ft.; left, 1 ft. After inflation—conversational voice: right, 4 ft.; left, 6 ft. Whisper: right, 3 ft.; left, 3 ft. Test for paracusis in loud noise—conversational voice: right, 4 ft.; left, 6 ft. Whisper: right, 2 ft.; left, 4 ft. (Heard better than normal individual.) Hearing slightly better with electric aid.

CASE III.—J. J., male, aged 62. Mental condition good. Deafness five to six years; gradually worse; right equals left. Paracusis: three to four years. No deafness in family. Earache in childhood. Discharge: none recently. In childhood, discharge in both. Tinnitus: "rushing of water" for years. No vertigo. Post-suppurative effects in the middle ears on both sides. Weber to left. Rinne negative to all tones of Edelman series in both ears. Bone conduction diminished; right, 15 seconds; left, 19 seconds. Low tone limit: right, 100 d.v.; left, 190 d.v. High tone limit: very much down in both ears. Conversational voice: right, 2 ft.; left, 1 in. Whisper: right,  $1\frac{1}{2}$  ft.; left, 1 in. After inflation—conversational voice: right, 4 ft.; left, 3 in. Whisper: right, 2 ft.; left, 1 in. Paracusis test in engine room—conversational voice: right, 6 ft.; left, 4 ft. Whisper: right, 3 ft.; left, 6 in. Hears much better with electric aid—conversational voice: right, 9 ft. +; left, 9 ft. +.

CASE IV.—P. P., female, aged 89. Memory bad, history not reliable. Right tympanic membrane: opacities. Slight swelling on

## G. J. Jenkins

posterior wall of the meatus and also on anterior wall in region of the outer margin of the tympanic plate. Left ear similar to right; swellings not so marked. Weber to right. Rinne negative in both ears to all tones below 512 d.v.; neutral to C<sub>3</sub> in both. Bone conduction diminished in both, 50 to 60 seconds; C<sub>3</sub> fork; right, 20 seconds; left, 12 seconds. High tone limit, very much down in both. Low tone limit, up to 190 d.v. in both. Conversational voice: right, 1 in.; left, 2 in. Whisper: right, contact; left, contact. Paracusis test—conversational voice: right, 1 in.; left, 1 ft. Whisper: right, contact; left, contact. Hearing distinctly better in noise.

CASE V.—A. J., male, aged 58, not noticed to be deaf. No deafness, earache, or discharge at any time. Tinnitus a year ago; buzzing sound. No vertigo or headache. Tympanic membranes: opacities in both. Weber to right. Rinne negative to all tones below C<sub>3</sub> in both ears. Neutral to C<sub>3</sub> in both ears. Bone conduction slightly diminished with Edelmann special fork. High tone limit *slightly* down. Low tone limit good. Conversational voice: right, 24 ft.; left, 24 ft. Whisper: right, 21 ft.; left, 21 ft. (after inflation).

CASE VI.—H. A., male, aged 69 years. Mental condition fairly good; irritable. Deafness for six weeks in both ears; similarly six years ago; better hearing in quiet place; worse with a cold. No earache at any time. Discharge from both ears recently and six years ago. Tinnitus absent. Vertigo; dizziness. Has bad heart disease. Tympanic membranes: opacities. Weber: right equals left. Rinne: right negative to 512 and all tones below; left negative to 190 d.v. Bone conduction diminished, right, 10 seconds; left, 12 seconds. High tone limit very much down in both. Low tone limit about normal in both. After inflation—conversational voice: right, 24 ft.; left, 21 ft. Whisper: right, 18 ft.; left, 12 ft. Paracusis test in engine room—conversational voice: right, 12 ft.; left, 12 ft. Whisper: right, 1 ft.; left, 1 ft. In case of normal ear—conversational voice: right, 12 ft.; left, 12 ft. With electric aid—whisper: right, 21 ft.; left, 15 ft.

CASE VII.—L. D., female, aged 45. Osteitis deformans and acromegaly. Deafness, very slight, noticed three years. Earache in childhood. Discharge at no time. No tinnitus. Vertigo, three years off and on; ? cardio-vascular. Tympanic membranes: opacities in both. Weber to right side. Bone conduction diminished in both, about 15 seconds. Low tone limit good in both ears. High tone limit slightly down in both ears. Rinne positive to all tones. Conversational voice: right, 36 ft. +; left, 36 ft. +. Whisper: right, 36 ft.; left, 24 ft. Paracusis test, in slight noise—conversational voice: right, 15 ft. +; left, 15 ft. +. Whisper: right, 3 to 4 ft.; left, 3 ft. In loud noise—conversational voice: right, 15 ft.; left, 15 ft. Whisper:



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right,  $1\frac{1}{2}$  ft.; left, 1 ft. Compared with normal ear test at same time about equal. Hears better in left ear with electric aid.

CASE VIII.—T. H. M., male, aged 63. Has had hemiplegia. Mental condition poor. Deafness slight until one and a half years ago, and much worse about a year; hears better in the noise of street traffic. No deafness in family. Never earache, discharge, tinnitus, or vertigo. Tympanic membranes: opacities in both. Weber: right equals left. Rinne positive in both to all tones above 190 d.v.; lower tones not tested. Bone conduction diminished: right, 10 seconds; left, 10 seconds. Low tone limit doubtful. High tone limit very slightly down. Conversational voice: right, 3 ft.; left, 9 ft. Whisper: right, 2 ft.; left, 9 ft. Does not hear better with electric aid. Paracusis test +. Conversational voice: right, 6 to 9 ft.; left, 9 ft. +.

CASE IX.—G. F. J., male, aged 76. Could not obtain history. Tympanic membranes: opacities in both; Weber to right ear, all tones. Rinne negative to highest tones in both ears. Bone conduction diminished: right, 56 seconds; left, 60 seconds. High tone limit: right, C<sub>3</sub> heard, but limit very much lower than normal; left, some tones heard about C<sub>2</sub>. Conversational voice: right, 2 in.; left, as a noise. Whisper, right and left. Paracusis test (engine room)—conversational voice: right, 3 ins.; left, hears voice. Seemed to hear better in noise.

An analysis of the cases above described will show that A. C., W. P., J. J., A. J., P. P., might be described as having similar symptoms and signs to those of "Otosclerosis," with internal ear deafness more prominently marked than usual. The symptoms and signs in H. A. are those of an early case of "Otosclerosis group." H. T. M. is difficult to classify, and in G. F. J. the condition is similar to that found in an advanced case of Otosclerosis in an old patient. L. O. has internal ear deafness only, such as may be found in some members of the "Otosclerosis group."

If we include Mr Mollison's case, we have ten cases of deafness associated with the disease Osteitis Deformans, of which the greater proportion have some clinical features similar to those of Otosclerosis, in some cases obscured by a greater degree of "internal ear deafness" than is usually found in this condition.

I have examined only nine cases of Osteitis Deformans from the otological standpoint. They all had obvious affection of the skull bones, and they were all suffering from deafness in some degree, and I think it may be accepted that deafness is not obvious until the skull bones are affected.

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There was no recorded history of deafness in the family in any of these cases.

Since in Osteitis Deformans, the disease in the early stages probably involves the labyrinth at some distance from the foramen ovale, the internal ear deafness may be expected to be more prominent than would be the case had the foramen ovale been involved at the onset.

How far age deafness may be a complication in these cases, I am not prepared to say. Perhaps in some of them the overgrowth of bone at the internal auditory meatus (which is common) exerts a pressure on the auditory nerve and so influences the nature of the deafness (? in G. F. J.).

Though ten cases may not seem sufficient to justify a definite statement, yet, when the above are taken into consideration, I think it is likely that these cases do illustrate the character of the deafness found in Osteitis Deformans.

### Conclusions.

There is a similarity in the microscopical appearance of the diseased bone in Osteitis Deformans and "Otosclerosis." There are differences, however, which may be of great importance or merely accidental, depending on difference of age, activity of the disease, or other causes.

The deafness found in all cases of Osteitis Deformans affecting the head in a marked degree has some characters of typical Otosclerosis deafness.

It is necessary to beware of the danger of giving mere similarity too much value, but if there is a certain degree of similarity, clinically and pathologically, then it is natural to ask what is the outcome of these observations.

Can the two conditions be identical? Against this possibility is the absence of any hereditary tendency in Osteitis Deformans. Otosclerosis usually begins in early life and Osteitis Deformans is, as a rule, recognised late in life; though the latter has been found to appear before the age of twenty. The general affection of the bones of the body in Osteitis Deformans is in contrast with the localised affection in Otosclerosis. We do not find any family history of Otosclerosis in Osteitis Deformans.

If the two diseases are due to the same fundamental cause, then the difference in distribution must depend on the individual, and in "Otosclerosis," the peculiarity (probably anatomical) which renders the individual liable to the affection, must be hereditary.

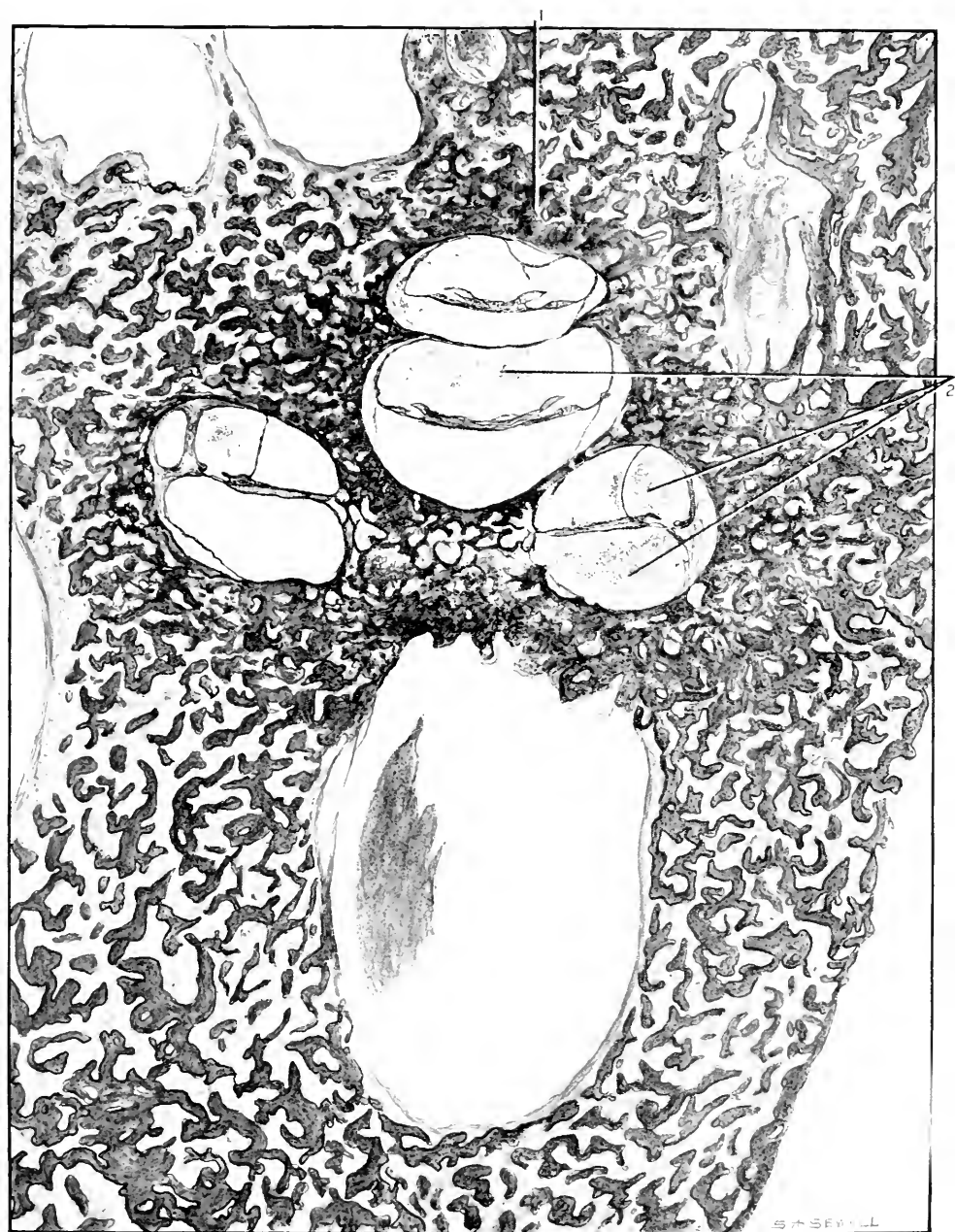


FIG. 1.



FIG. 2.

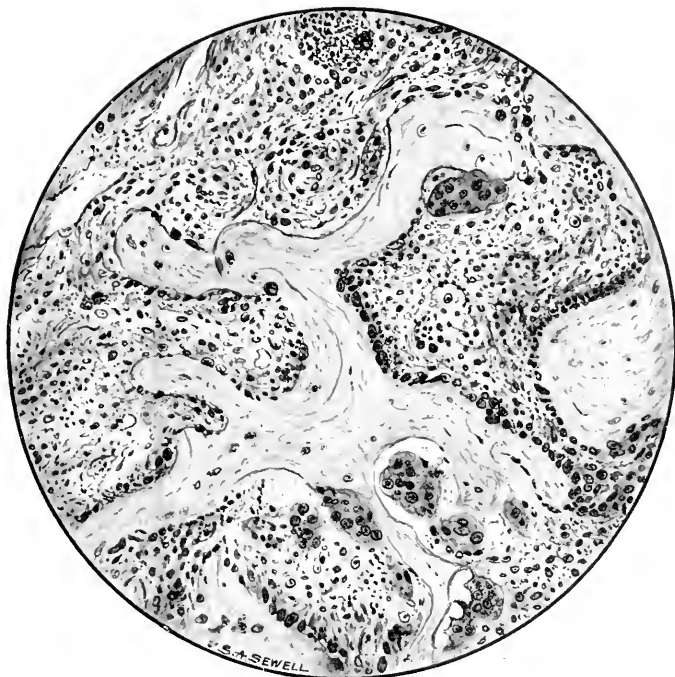


FIG. 3.



FIG. 4.



FIG. 5.



FIG. 6.



FIG. 7.



FIG. 8.



FIG. 9.



FIG. 10.



# Osteitis Deformans and Otosclerosis

Lastly, the causes of these bone diseases may be quite distinct, but there is one characteristic common to both that produces the changes in the labyrinth and the consequent similarity of symptoms and signs of the deafness.

In conclusion, I wish to say that most of this work was done at Lambeth Infirmary. My best thanks are due to Dr Stebbing for his care in eliminating other bone diseases in eight of the cases of Osteitis Deformans, and also to Dr Perdeau for his kindly help and for facilities afforded me in his laboratory.

## DESCRIPTION OF PLATES.

FIGS. 1 and 3.—Selected from serial celloidin sections of the same specimen. Cut  $15\ \mu$ .

FIGS. 2, 7, 8, and 10.—Selected from serial celloidin section of the same specimen. Cut  $15\ \mu$ .

FIGS. 4, 5, 6, and 9.—Selected from serial paraffin sections of the same specimen. Cut  $7\ \mu$ .

1. *Osteitis Deformans*.—General affection of the Temporal Bone. (1) Small Islands of apparently healthy bone in close relation to the Endosteum. (2) Deposit within the labyrinth—Gram-positive and probably fibrinous. 2-inch objective.

2. *Otosclerosis*.—Localised disease. (1) Sharply defined limits of the disease. (2) Deposit within the labyrinth—Gram-positive and probably fibrinous. 2-inch objective.

3. *Osteitis Deformans*.—Very cellular part with large osteoclasts and many osteoblasts. Lamellæ in the trabeculae of bone in the diseased area well defined.  $\frac{1}{2}$ -inch objective.

4. *Osteitis Deformans*.—Much fibrous tissue formation. Osteoclasts.  $\frac{1}{2}$ -inch objective.

5. *Osteitis Deformans*.—Osteoclasts. Much fibrous tissue.  $\frac{1}{2}$ -inch objective.

6. *Osteitis Deformans*.—(1) New bone formation invading the interior of the labyrinth. 2-inch objective.

7. *Otosclerosis*.—Well-defined limits of the disease. Trabeculae in diseased area darkly stained. Lamellæ in diseased area indistinguishable. Osteoclasts. Fibrous tissue in small amount. No osteoblasts.  $\frac{1}{2}$ -inch objective.

8. *Otosclerosis*.—(1) Blood vessels. (2) Osteoclasts. Lamellæ indistinguishable.  $\frac{1}{2}$ -inch objective.

9. *Osteitis Deformans*.—Region of Foramen Ovale. (1) Seventh Cranial Nerve. (2) Footplate of Stapes. (3) Crus of Stapes. Stapes is free. 2-inch objective.

10. *Otosclerosis*.—Region of Foramen Ovale. (1) Middle ear cavity. (2) Tensor Tympani. (3) Seventh Cranial Nerve. (4) Fusion of footplate of the Stapes with margin of the Foramen. (5) Footplate of the Stapes.

## FOUNDATIONS OF OTOTOLOGY: THE WORK OF FLOURENS.\*

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THE systematic study of otology may well be preceded by a consideration of some of those fundamental principles of physiology which form the basis of our knowledge. In such a review, almost at first glance, the name of Flourens will be met with; but although this physiologist is quoted in nearly every text-book of physiology and by many writers on otology, his work is seldom studied, as it deserves to be, at first hand.

Born at Maurheilhan in the Department of Hérault, in the year 1794, Marie Jean Pierre Flourens graduated as Doctor of Medicine at the University of Montpellier when he was nineteen years old, and proceeded to Paris in the following year. His earliest important work was a communication, in 1822, to the Academy of Sciences. This was the first of a long series of memoirs on physiology and kindred subjects, chiefly reports of his experimental researches.

At that time, anatomy had been studied and dissection practised during at least five centuries. Yet, in spite of the vigorous growth of anatomical knowledge, several causes had combined to retard the advance of physiology, particularly the physiology of the nervous system. The nervous system had long been recognised both as the seat of perception, volition, and memory, and as the agent through which the animal receives sensations and executes voluntary movements; but, so far, there was no clear idea how these phenomena were produced. In the eighteenth century, the brain was considered to be the general organ of sense, within which the soul perceives and judges of the sensations of all the sentient parts; while the nerves, arising from the medullary substance of the brain and spinal cord, convey thence the "Animal Spirits" to every part of the body for the performance of all the actions of sense and motion.

These ideas, apparently overthrown by Haller's demonstration of the irritability of muscular tissue, had recently been

\* An Introductory Lecture delivered at the opening of the Winter Session, at the Central London Throat and Ear Hospital, on 26th October 1922.

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revived at Montpellier in a slightly altered form. The view most generally accepted was that all nervous phenomena are the result of one common property possessed by every part of the nervous system. The brain, the spinal cord, and the nerves were imagined to be endowed with equal powers, and to form a reservoir from which the nerves convey the power of motion to the limbs, and at the same time, receive sensations into it.

The complete discrepancy between this hypothesis and actual facts passed unnoticed. Yet cases of disease in which the power of movement was lost, while sensation remained, were as common then as they are now. Flourens considered that this and other clinical and pathological facts indicated that sensation, movement, and volition are essentially distinct properties, and therefore, he argued, each must have a distinct seat. This proposition he set out to prove by direct experiment. Sir Charles Bell's important discovery of the distinction between the motor and sensory nerves, communicated to the Royal Society in the previous year, was then unknown to him.

His memoir, entitled "Determination of the Properties of the Nervous System or Physical Researches on Irritability and Sensation," was presented to the Academy of Sciences in March and April 1822. A Commission of the Academy of Sciences, consisting of Portal, Count Berthollet, Pinel, and Duméril, with Baron Georges Cuvier at its head, was appointed to report upon it; and Flourens repeated his principal experiments before the Commission. The report of this Commission, a document of some length, is itself a valuable contribution to science. In the course of the Report, Cuvier says: "He lastly comes to the encephalon. It was here that some new light might be expected, from experiments better directed than those of earlier physiologists."

Flourens was, in fact, the first experimenter on the brain who surmounted the difficulty of ensuring the necessary precision. His method consisted, first, in making a complete exposure of the region of the brain which was to be the subject of experiment, so as to have the progress of the operation under his eye, and thus to make sure of keeping within the desired limits; and, secondly, to experiment on each part in turn, quite separately from the others. He found that when the cerebral hemispheres of a pigeon had been removed, it passed at once into a lethargic state, like an animal asleep, and remained perfectly quiet unless disturbed. The bird stood

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upright on its feet, but all power of spontaneous movement was lost. It flew only when it was thrown into the air; it walked only as it was pushed forward; it swallowed only when food or water was put into its beak. Yet, when flight, walking, or swallowing had commenced, the whole action continued with perfect regularity. Perception was lost as well as volition: hearing was abolished, and also sight, although the iris continued mobile. Placed on its back, the bird got up again; and, in whatever position it was put, it regained its equilibrium perfectly, and did not rest until it had done so.

This may be contrasted with the effects of removal of the cerebellum by successive layers. During removal of the superficial layers, only a slight feebleness and want of harmony in movements occurred. When the middle layers were reached an almost general agitation showed itself: the animal, while continuing to see and hear, executed only sudden and unregulated movements. As the removal was continued, equilibrium was almost entirely abolished. The animal had the utmost difficulty in holding itself erect, and only managed to support itself by the aid of its wings and tail. When it walked, its staggering and hesitating steps gave it the appearance of intoxication. In spite of the support of its wings, it often fell down and rolled over.

Thus, the faculty of jumping, of flying, of walking, and of standing upright was lost by degrees; and, when the cerebellum had been entirely removed, the power of executing regulated movements had altogether disappeared. Placed on its back, the bird could not get up again, and exhausted itself in vain efforts to regain its balance, and finally rested as it lay. Nevertheless, its senses were so alert that the slightest noise or gesture caused it to recommence its struggles. In a word, it had preserved the faculty of perception and volition, but the power of co-ordinating its movements was entirely lost. Removal of the cerebellum in guinea-pigs produced similar effects. Cuvier said: "We can recall nothing that any physiologist has discovered which at all resembles these singular phenomena. Experiments on the cerebellum of quadrupeds and particularly on adults, are very difficult, on account of the large bony parts which it is necessary to remove, and the large vessels which must be opened. Most experimenters, moreover, operated according to some system conceived beforehand, and saw a little too

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much what they wished to see. Certainly, no one had yet suspected that the cerebellum was in some sense the balance-pole and regulator of the movements of translation of the animal. This discovery, if repeated experiments with all proper precautions confirm its general correctness, can only reflect the greatest honour on the young observer whose work we have just analysed." In September of the following year, Flourens read a paper to the Academy of Sciences, containing a report of further researches on the same subject, which completed the proof of his proposition. In December 1824, he presented a memoir entitled "Researches on the Fundamental Conditions of Audition," in which he showed that the cochlea alone is the true organ of hearing. In the course of this research, Flourens carefully exposed the semicircular canals in a pigeon, and divided them one after the other with very fine scissors. "At each section," he says, "a phenomenon occurred of so singular a character that, because of its very singularity, and in order not to interrupt the history of the hearing power, I have thought it best to describe it separately."

Returning to the subject later, he described the effects of section of the horizontal canals. In addition to this, in 1828, he presented two other memoirs to the Academy of Sciences, entitled respectively "Experiments on the Semicircular Canals of Birds," and "Experiments on the Semicircular Canals of Mammals." In order to avoid repetition, and for the sake of clearness, the following account is abridged, but the language of the author is translated as literally as possible.

Section of both horizontal semicircular canals in a pigeon was accompanied by acute pain, and by a sudden horizontal movement of the head, which was carried from side to side with inconceivable rapidity. This violent movement of the head gradually subsided; but, if the internal wall of the canals was pricked with a needle, or if the bird made the slightest attempt to move, the peculiar oscillation of the head returned at once. While it lasted, the eyes and eyelids were in a perpetual state of agitation. The animal could see and hear, and appeared to retain all its instincts and intelligence. Its body was in a state of perfect equilibrium while standing still; but, as soon as it began to walk, the movements of the head began again. The more quickly the animal moved the greater was

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the agitation of the head, and the greater also was the disturbance of every other movement; until, finally, all regular movement became impossible. "Almost," says Flourens, "as equilibrium and stability of movements are lost when a person turns round and round several times, or violently shakes his head." Running or flying was quite impossible. Sometimes, in fact, the animal merely attempted to turn round, and lost its balance in doing so. It fell, rolled over, and struggled for a long time without succeeding in getting up again.

The latter part of the phenomena bore a striking similarity to the effects which follow lesions of the cerebellum; but a careful examination of the cerebellum showed it to be in a state of perfect integrity. Nevertheless, in his future experiments, Flourens took special precautions to avoid the possibility of any such complication.

When one horizontal canal only was divided, similar movements of the head occurred, but in a slighter degree, and the bird presently regained its power of walking without disturbance of equilibrium. On the other hand, after section of both horizontal canals, the condition was permanent. All the phenomena were reproduced whenever the bird made the least movement. Pigeons quickly recovered from the effects of the operation, and the two wounds rapidly healed; but the oscillation of the head, the rotation of the body, and the loss of equilibrium persisted as long as the bird was alive. After a time, the oscillation of the head diminished in force, but the rotation of the body hardly lost any of its intensity: it was renewed every time the animal was made to move quickly.

In a pigeon killed six months after the section, the bones of the cranium, which had been removed, were found to have been reproduced. The two divided canals were obliterated at the points where they had been severed. All parts of the brain were in a state of perfect integrity.

When the left inferior vertical semicircular canal of a pigeon was divided, a slight but rapid movement of the head in the vertical plane appeared, which lasted only a moment. Left to itself, the animal stood upright, and walked and flew with regularity. It only experienced from time to time a sort of jerk or an abrupt movement of the head backwards, which disturbed its balance for a moment, and sometimes even was almost enough to overthrow it backwards. After

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some moments this movement disappeared, and only reappeared at long intervals.

On dividing the inferior vertical canal of the other side in the same bird, the vertical movement of the head reappeared suddenly, and with a violence and impetuosity similar to that of the horizontal movement following section of both horizontal canals. This vertical movement lasted almost continuously. Sometimes the head leaned a little, to one side or the other, so as to make a half turn, but the dominant direction was always up and down. While standing still, equilibrium was maintained. In order to retain it most effectively, the animal leaned its head on the ground, and it was almost always with the top of its head reversed that it rested thus. The movement of the head was invariably made more active by all the other movements of the body: in its turn, it disturbed and disordered these movements to such an extent that all regular movement finally became impossible.

The animal could no longer run or fly. If it was thrown into the air, after some incoherent movements of its feet and wings, its whole body became stiff, and it fell like an inert mass. The globe of the eye, and the eyelids showed the same convulsive agitation as in the preceding case. The animal never turned on its axis, but it often turned over backwards involuntarily, falling on its tail, and sometimes it revolved for a long time in this direction.

Flourens kept this pigeon for almost a year. It ate and drank of its own accord, although it had immense difficulty in controlling the movement of its head for an instant for the purpose of taking drink or food. It could never fly. As soon as it attempted to walk rather quickly it fell and rolled over backwards. It nearly always remained in the same posture, with the top of its head reversed resting on the ground or against the bars of its cage. The vertical movement of the head, and the effects of this movement upon all the other movements of the body constantly persisted, and always with a nearly equal intensity.

Division of the large or superior vertical canal of the left side in a pigeon was followed by a slight but rapid movement of the head in a vertical direction. The movement was of short duration. The bird walked and held itself up steadily; it only experienced from time to time, a movement like a tumble forwards.

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When the superior vertical canal of the other side was divided in the same pigeon, a sudden and violent vertical oscillation of the head at once occurred. This movement led, as in all previous experiments, to disturbance of the equilibrium. It ceased in the same way when the animal was in repose, and began again in the same way when it moved.

It invariably increased the more quickly the animal tried to move; it was always accompanied by rotation of the eyeball and convulsive agitation of the eyelids. The animal did not turn sideways, nor did he turn over backwards; he fell, on the contrary, head foremost. Flourens kept the pigeon in this condition nearly a year.

Division of all the canals, on both sides, in a pigeon, was immediately followed by an uncontrolled and irregular movement of the head in all directions. This movement was extremely violent; it disturbed and disordered the balance of the entire animal, which only obtained some rest by leaning its head on the ground.

If the osseous semicircular canals of a pigeon were opened without touching the internal parts of the canals, no sensible effects were produced. But if the parts contained in the canals were then pricked with a needle, the animal showed signs of acute pain, and the characteristic movement of the head appeared immediately. Section of the semicircular canals does not interfere with life, but the effect continues as long as the bird lives. Complete destruction or profound bruising of the semicircular canals leads to movements of such disorder and violence that the animal exhausts itself in vain efforts: it can neither eat nor drink, and finally succumbs. Flourens repeated these experiments on fowls, on sparrows, on greenfinches, on linnets, and other small birds. In essential details the phenomena were always the same.

Now that it had been shown that the effects following section of the semicircular canals are constant and general in Birds, it was necessary to ascertain how far they were reproduced or modified in other classes, and especially in Mammals. For several reasons, however, this proved to be a task of greater difficulty. Young rabbits from six weeks to two months old were found to be the most suitable subjects. In a rabbit of this age the horizontal canals of both sides were exposed, and the horizontal canal on the left side was divided. The head of the animal immediately began to oscillate from side to side: it did



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not attain such rapidity as in pigeons, and instead of ceasing almost at once, it persisted in a less degree for several hours. The oscillation ceased during repose, and began again directly the animal made a movement; the more quickly the animal moved, the stronger the oscillation became. This movement of the head was always accompanied by a very lively agitation of the eyes and eyelids, which ceased as soon as the head was at rest. In the state of repose the head was almost always held inclined to the left, rarely in its natural position, and never to the right. Moreover, the animal often turned round, and always towards the left side.

The horizontal canal on the other side was then divided, when the horizontal movement of the head at once became more violent. It was sometimes even so intense that not only the head but the fore paws and all the anterior part of the body were carried from side to side. This movement disturbed and disordered all the other movements; when the animal attempted to run, it fell and rolled on the ground. In a state of repose the movement ceased, but if the animal even moved its head the oscillation began again. The eyeballs and eyelids were in a perpetual state of agitation during the peculiar movement of the head. This rabbit survived more than a month.

Section of the right horizontal canal in another rabbit was followed by the appearance of all the phenomena as in the former rabbit, but with this difference; that, this time, the head was almost always inclined to the right, and it was always to the right side that the animal turned round.

It was noted that after both horizontal canals had been cut, the head resumed its position in the median line, and rotation took place to either side indifferently.

In another rabbit, the posterior vertical canals were exposed, and the canal on the left side divided. Immediately there ensued a movement of the animal's head upwards and downwards, which sometimes carried the whole body of the animal backwards, and almost made it fall on its back. The eyes and eyelids were in a state of agitation as long as the movement of the head lasted. Moreover, this movement of the head, which stopped almost at once in pigeons when a single canal was cut, still persisted in this rabbit several hours after the operation, and when it had stopped, it was always renewed on the slightest voluntary movement.

In the same rabbit the vertical posterior canal of the right

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side was cut. The vertical motion of the head immediately became more violent, and the backward falls more frequent and more forcible; consequently all the other movements of the animal, such as walking, running, or leaping were more disordered. Finally, as usual, the motion of the head ceased in repose, and started again on movement; it was the same with the rotation of the eyeballs. This rabbit survived for seven or eight days.

With regard to section of the anterior vertical canal (that is the superior or internal of birds) it was here that the difficulty occurred. In rabbits, the cerebellum presents a little pedunculated lobe on each side, which is encircled by the canal, in such a way that the canal is concealed in a deep groove between the cerebellum on the one side and the expansion of the lobule on the other. From this cause, Flourens found it quite impossible, in rabbits of the same age as before, to divide the canal without injury to the lobule or to its attachment to the cerebellum. After several trials, however, he sometimes succeeded in doing so in rabbits of twelve or fifteen days old: yet, even at this early age, it was not always possible.

In those cases in which division of the anterior vertical canal was carried out without injury to the cerebellum, the movement of the head up and down, and the propensity to fall forward, which accompanied section of the canal in birds were invariably reproduced. Sometimes, too, in rabbits, the vertical movement of the head was accompanied by a horizontal movement, and by rotation of the body. Flourens observes here: "Although the phenomena produced by division of the semicircular canals have a very marked analogy with the cerebellar phenomena, these two orders of events are quite distinct from each other. In more than twenty experiments on the canals, I constantly convinced myself of the complete and absolute integrity of the cerebellum. It is evident that if the oscillation of the head was not a phenomenon proper to the semicircular canals, its direction would not vary according to the direction of the canals. Injury of the cerebellum is not followed, in any case, by such an oscillation of the head, although the movements of the animal after such a lesion are very confused and disordered."

In April 1861, Flourens made a further communication to the Academy of Sciences (*Comptes rendus*, t. lii.) entitled "New Experiments on the Distinction between the Cerebral

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Functions." In the course of this paper he showed that, after preliminary removal of the cerebral hemispheres in pigeons and rabbits, lesions of the cerebellum or sections of any of the semicircular canals produce the same effects respectively as similar operations on animals with the cerebral hemispheres intact. He does not seem to have investigated the effects of section of the semicircular canals in animals with intact hemispheres but after removal of the cerebellum.

Flourens' results may be tabulated thus:—In birds, removal of the cerebral hemispheres does not interfere with the power of maintaining or of returning to the erect position. Ablation of the cerebellum causes complete loss of equilibrium and of co-ordination. Section of any pair of semicircular canals is followed (after subsidence of the disturbance caused by the operative interference) by five effects, which appear only on movement, or when the membranous canals are irritated, viz.:—1. Oscillation of the head in a particular direction. 2. Loss of equilibrium with inability to fly. 3. A tendency to fall in a particular direction. 4. Quick movements of the eyes and eyelids. 5. Forced movements.

When either of the pairs of vertical canals has been cut, the head is held in a peculiar position during rest. In rabbits the effects are similar.

It will be noticed that Flourens performed two experiments. In one, a semicircular canal was divided; in the other, an exposed membranous canal was irritated at one spot. In neither case was the ampulla or its contents interfered with. The results of these experiments on the semicircular canals were so unexpected and so novel that it is not to be wondered at that their true meaning was not then understood. In his memoirs to the Academy of Sciences, Flourens confined himself almost entirely to statements of observed facts.

Cuvier expressed himself thus: "The results of the experiments of M. Flourens have," said he, "a striking resemblance to those which our confrère Magendie obtained by dividing the pons varolii. The Academy remembers, no doubt, having seen the rabbits on which he had performed this operation, turn on their axes in a very similar way to those shown us by M. Flourens. This resemblance of effects is due perhaps to the intimate relations of the acoustic nerve with the crura of the cerebellum; but it is only by still more numerous and more varied experiments, bearing on the same

## W. J. Chichele Nourse

nerve, and on the adjacent parts of the encephalon, that we shall arrive at the true point from which these movements emanate." (Report to the Academy of Sciences, November 1828.)

Some years later Flourens endeavoured to explain the phenomena, but without much success. His other works, many of which are interesting lie outside the scope of this lecture.

The estimation in which he was held is shown by his election as Perpetual Secretary of the Academy of Sciences, a post which he held up to the time of his death in 1867.

To Flourens we owe the first rational conception of the functions of the central nervous system. By proving that the different organs of the encephalon have distinct functions, he helped to shatter finally that antique fiction which had so long retarded the advance of science. Amongst other things, he showed that the functions of the cerebellum include the co-ordination of movements and the maintenance of equilibrium. In the ear, he proved that the cochlea is the true organ of hearing. His researches on the semicircular canals, so deftly carried out, and so carefully recorded, form a basis of fact—the fundamental experiment, as Professor Politzer called it—which forms the foundation of our present knowledge.

Although unable, in the dim light of that age, to discern in the vestibular system another organ of sense, he perceived it to be entirely distinct from the organ of hearing, and claimed for its nerve a separate place among the cranial nerves.

Lastly, it must not be overlooked that the accuracy of the finest part of his work rests, not on himself alone, but on the authority of the Academy of Sciences of the Institute of France, that noble foster-mother of all the sciences.

# CLINICAL RECORD

## MUCOCELE OF THE FRONTAL SINUS.

By SIR ST CLAIR THOMSON, Professor of Laryngology, and  
DR CHARLES H. M'ILRAITH, First Assistant.

From the Throat Clinic, King's College Hospital, London.

INTRODUCTION.—Our attention was recently called to the comparative rarity of this affection by a reprint kindly sent by Dr Virginius Dabney of Washington. It is entitled "Mucoccele of the Nasal Accessory Sinuses," and is published both in the *Transactions of the American Laryngological Association* for 1921, and in the *New York Medical Journal* for 9th December 1921.

BIBLIOGRAPHY.—The article contains many points of interest concerning the etiology, pathology, and diagnosis of this affection, but what struck us most was the opinion of the writer that "mucoccele is a rare condition when compared with other forms of nasal accessory disease." Killian is quoted as having been able to collect only sixty-four recorded cases. Dr Dabney states that he has personally examined all available literature on the subject, and that he has found a description of seventy-four cases in the fifty-eight articles of which he gives a very full bibliography. With such, it is unfortunate that he has overlooked two very valuable papers on the subject by Dr A. Logan Turner.\*

RARITY.—While appreciating that mucoccele is not a common complaint, we had not realised that it was so rare that the total score of recorded cases had not yet reached a hundred. Quite a fair number have been seen and treated in this clinic in past years. In view of Dr Dabney's interesting and valuable research we feel it a duty to record the latest we have met with.

*History of Case.*—A woman aged 62 years, Mrs T., was referred from the Ophthalmic Department complaining of a dull, heavy feeling in the left forehead, with double vision, getting gradually worse for about nine months. Her previous health had been good except for slight frontal headaches, more severe on the left side. Her eyesight had been perfect. She had not had an excessive number of head

\* "A Contribution to the Pathology of Bone Cysts in the Accessory Sinuses of the Nose," *Edinburgh Medical Journal*, Oct., Nov., Dec. 1903, Jan. 1904, and "Mucoccele of the Accessory Nasal Sinuses," *Edinburgh Medical Journal*, Nov., Dec. 1907.

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colds. The nose had not been stopped up and there had been no constant nasal discharge.

*Onset.*—In October 1921, she one day suddenly felt giddy, as if something went snap in her head, and she fell down—apparently forward and to the left. She was dazed for a time but did not suffer any injuries. There was no bruising of the face and no epistaxis.



FIG. 1.—Mucocoele of the left Frontal Sinus. Shows rounded swelling above inner canthus and displacement of the eyeball downwards and outwards; before operation.

Following on this, she became giddy at times and experienced frequently the sensation of flashes of light.

*Eye Symptoms.*—The first symptoms were referable to the eye. In January 1922, she began to notice that her left eye was affected, and that she had double vision. At this time she also experienced severe pain in the head—left temporal and left frontal regions. She could not sleep. The pain and giddiness were aggravated by stooping. The left eye became more prominent and was displaced downwards and outwards. The severe pain in the head and behind the eye gradually subsided into a dull heaviness, and the giddiness was not so intense.

# Mucocele of the Frontal Sinus

*Ophthalmic Examination.*—Left eyeball displaced forwards, downwards, and outwards (Fig. 1). Movements of the eyelids and eyeball are good. The fundus is normal.

*Nasal Examination.*—There was a well-marked rounded swelling to be felt, firm and semi-fluctuant, above the inner canthus of the left eye and extending outwards under the eyebrow as far as the supraorbital notch. The anterior wall of the left frontal sinus was slightly more prominent than on the right side. The orbital margin of the frontal bone could be clearly defined. "Egg-shell crackle" could not be elicited. There was no pain on palpation. Trans-



FIG. 2. Mucocele of the left Frontal Sinus: after operation. The eyeball has returned to its normal situation.



FIG. 3. Mucocele of the left Frontal Sinus: after operation. Shows that there is no disfigurement, in spite of the unavoidable loss of the Killian bridge.

illumination showed the frontal sinuses apparently clear. Radiographic examination showed a very large frontal sinus on the left side, with indistinct shadow continuing downwards into the orbit.

Intranasal examination revealed nothing except a somewhat enlarged anterior end of the middle turbinate and bulging apparently of the bulla ethmoidalis on that side. No pus or other discharge was visible in either of the nasal fossæ.

*Operation* (by Dr M'Iraith).—The left eyebrow was shaved. An incision (Killian's) was made, commencing just inside and above the supraorbital notch and continued along the line of the eyebrow inwards to the nasal bridge and then curved downwards for about half an

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inch round the edge of the orbit. This was carried through the soft tissues down to the periosteum. Hæmorrhage, which was moderately severe, was checked, and the soft tissues retracted. The incision (Killian's) was made through the periosteum down to the bone.\*

On separating the periosteum along the orbital ridge a soft doughy mass immediately presented. On opening this, a large amount of thick, almost caseous, dirty, green secretion was disclosed. After this had been mopped out, the cavity was found to extend backwards behind the eyeball and upwards into the frontal sinus. The whole orbital plate of the frontal bone had been eroded and absorbed. The anterior wall of the frontal sinus was eroded and thinned; this was removed, as well as the remainder of the orbital plate. It was found impossible to save the bony bridge. The periosteal bridge, however, was preserved. The anterior end of the left middle turbinate was removed, the agger cells broken down, and the passage from the frontal sinus to the nose was enlarged with a Watson-Williams' raspatory sufficiently to admit the tip of the little finger. A large drainage tube was inserted, the one end opening at the outer angle of the wound and the other brought through the nose. The soft parts and skin were brought carefully into position and sutured. Iced boracic compresses were applied.

*After History.*—Very little pain or discomfort was complained of afterwards, and there was no cedema or ecchymosis of the orbit. Daily lavage with boracic lotion through the drainage tube was carried out. On the fourth day the tube was withdrawn and a smaller one placed in position. This was done by attaching the smaller to the larger one by strong silk at the outer end and withdrawing the larger tube from the nose.

The stitches were removed on the sixth day, and the smaller tube on the twelfth day. Lavage through the nose was kept up. By this time the diplopia had practically disappeared. Her further progress was uneventful.

Three months after the operation the patient's general health is good, she suffers no pain, and has no headaches or giddiness. The movements of the eyelids and eyeball are good; the vision is normal with no diplopia. Intranasal examination shows no pus nor abnormal discharge, and there is a free opening into the frontal sinus. There is no disfigurement and the unavoidable loss of the "Killian bridge" has not led to the disfiguring "frog face" which is sometimes dreaded (see lateral view in Figs. 2 and 3). This is, doubtless, due to the careful preservation of the periosteum and of the outer part of the bony ridge.

\* See *Diseases of the Nose and Throat*, St Clair Thomson, Second Edition, 1916. Pictures on pp. 284-5.



## SOCIETIES' PROCEEDINGS

### ROYAL SOCIETY OF MEDICINE—SECTION OF OTOLOGY

February 16, 1923.

*Chairman*—Sir CHARLES BALLANCE, K.C.M.G., M.S.

**Otosclerosis and Osteitis Deformans: A Pathological and Clinical Comparison**—G. J. JENKINS, F.R.C.S.—(The paper is published in the *Journal of Laryngology and Otology*, July 1923, p. 344.)

#### DISCUSSION.

Sir CHARLES BALLANCE (*Chairman*) said that he was very glad Mr Jenkins was taking up this subject and hoped he would continue his research into the intimate pathology of these two diseases, especially osteitis deformans. He trusted that when the exact pathology was known it would be possible to cure, or, at least, to arrest the disease. In the old days he (Sir Charles) had himself operated on this class of case, and had always found that he could not get beyond the disease in various parts of the skull; local recurrences took place.

A feature of interest was the fibrinous deposits. Such deposits usually indicated inflammation, and, if that were so in these cases, the discovery might lead to some method of elucidating the real nature of these processes.

Dr ALBERT A. GRAY said he believed this was the first time that there had been an actual demonstration of the similarity between the changes in bone in otosclerosis and in other diseases of bone, though, of course, the similarity had been suspected. He himself had suspected that there might be a similar change in cases of locomotor ataxy in which spontaneous fractures occurred. The specimens and cases showed definite otosclerosis: there was the sharp line of demarcation and the absence of an inflammatory zone. He had been interested in seeing Mr Jenkins demonstrate the osteoclasts, because Manasse held that these were not present, bone being absorbed by simple pressure. But he (Dr Gray) had demonstrated osteoclasts, and now Mr Jenkins had also done so. He (Dr Gray) did not agree with Mr Jenkins that otosclerosis began with evidence of nerve deafness, and it would be a very difficult point to prove. The earliest case of otosclerosis in which he had cut sections was one in which the deafness had existed three years, and in that case there had been a very definite change in the bone. He thought that in all otosclerosis cases, and perhaps in osteitis deformans too, there might be nerve disease, but not a disease of the cochlear branch of the auditory nerve. The views of pathologists as to the causation of osteitis deformans would be interesting; possibly that disease

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and otosclerosis might be grouped together. They might be nutritional diseases, *i.e.*, the nerves governing the blood supply and the general nutrition of the bone and other structures might be affected in both diseases; he suspected that was the secret in otosclerosis. It would also be interesting to know whether there was any other disease in bone like that in otosclerosis.

Mr SYDNEY SCOTT said that about twenty years ago he had examined six cases of osteitis deformans, and made many visits to infirmaries looking for cases. One of the male patients whom he had examined had subsequently died, and the skeleton had been placed in St Bartholomew's museum. In 1907, he had cut some sections of one of this man's temporal bones, and they exactly resembled the first one of Mr Jenkins' present series. The decalcified bone was embedded and cut in paraffin, which yielded thinner sections than those embedded in celloidin, but they were much more difficult to prepare. He (Mr Scott) could confirm Mr Jenkins' observation on the stapes; in his own case the stapes was not ankylosed but was absolutely normal, thus differing from what was seen in the specimens of otosclerosis. The osteoporosis of osteitis deformans was diffuse; he had cut sections from the tibia, and one could scarcely tell the difference, under the microscope, between the tibia and the affected part of the petrous bone. He had seen osteoclasts, which Mr Jenkins also described. With regard to the hearing tests, in 1903, he had no Bezold forks, but had used ordinary tests and could not distinguish the deafness of these cases from ordinary senile deafness. It was curious that patients with osteitis deformans should so often become affected by malignant disease. He thought that the occurrence of the fibrinous exudate in the cases shown by Mr Jenkins might prove to be a pure coincidence. He (Mr Scott) did not think that changes in the labyrinthine fluid were necessarily connected with the osseous changes. In cases of osteitis deformans, the patients often died from some intercurrent terminal disease, such as pneumonia, or bronchitis, which might possibly affect fluid tissues.

Mr RITCHIE RODGER asked whether he rightly understood Mr Jenkins that there was no history of hereditary disease in osteitis deformans. Osler had stated that there had been seventy-five cases recorded, and that at least six of these had shown a definite hereditary history. In the article referred to, by Emerson, leontiasis ossia and acromegaly were grouped with the diseases now under discussion. He (Mr Ritchie Rodger) thought physicians were now inclined to attribute osteitis deformans and leontiasis ossia to a disturbance in the proportions of the secretions of the endocrine glands. Possibly some elucidation of the pathology of otosclerosis might come along this line.

Sir JAMES DUNDAS-GRANT described the case of a lady in advanced middle life, complaining of deafness and presenting the features of osteitis deformans. Her deafness was a combination of obstructive and nerve deafness, and the hearing was improved to some extent by the Eustachian catheter and bougie (the Eustachian tubes being extremely narrow, suggesting some narrowing of their osseous portions). Bone conduction was diminished, and there was deafness for all tones higher than 7 and 6 of Galton's whistle, pointing to a lesion of the cochlea. In this case an

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interesting complication was the occurrence of malignant disease, involving an amputation through the thigh.

Another case was that of a man of great intellectual ability, suffering from deafness and well-marked osteitis deformans. The right ear was quite deaf to all tones, including those of Galton's whistle. In the left ear, hearing was greatly reduced, and Galton's whistle was not heard above the mark 5.1. Rinne was negative for C1, bone conduction being slightly increased. The malleus under Siegel's speculum was fixed on both sides. The left Eustachian tube was only very slightly narrowed, and hearing was improved after inflation (even for Galton's whistle) to a greater degree than the mere inflation would account for, the improvement which the patient alleged indicating a functional element. There appeared to have been a "middle-ear" defect, and, as shown by the complete and rapidly developed deafness in the right ear and the lowered Galton on the left, a diseased condition of the internal ear such as the changes demonstrated by Mr Jenkins would explain.

He (Sir James Dundas-Grant) had had a case under his care when he was in general practice, of a patient suffering from deafness, vertigo, and optic neuritis. He had made a diagnosis of cerebellar tumour, and overlooked the co-existent osteitis deformans. At a hospital the osteitis deformans had been diagnosed and the cerebellar tumour overlooked. The osteitis deformans and the cerebellar tumour were both discovered at the post-mortem examination in an infirmary.

Mr G. J. JENKINS (in reply) said that the question of the etiology of osteitis deformans was as difficult as that of otosclerosis. In a proportion of the cases the patients die of malignant disease, but that in itself was not convincing evidence that osteitis deformans was malignant. The question of its being inflammatory or metabolic was equally difficult. One important point which had arisen out of this study was, that we should distinguish between internal ear deafness and nerve deafness; the present nomenclature was bad, because it was too general. Internal ear deafness should be looked upon as distinct from nerve deafness. He could not be sure about the fibrin in the labyrinth at the situation indicated, but the deposit was Gram-positive in staining, and this was a selective stain for amorphous fibrin. Whether it was accidental or a part of the disease was a difficult question. It might be because these patients were old subjects that fibrin was deposited in the labyrinths, or the deposit might be peculiar to otosclerosis and osteitis deformans, and might be an important factor in the pathology. In two of the cases he showed at the last meeting, the pituitary fossa was distinctly enlarged, and one case was obviously a mixed one, having both osteitis deformans and acromegaly. At a former meeting of the Section Mr Mollison had shown a case having some of the characters of otosclerosis; this paper was the result of the stimulus derived from that case.

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## SECTION OF LARYNGOLOGY

March 2, 1923.

*President*—C. A. PARKER, F.R.C.S.E.

**Multiple Papillomata of the Larynx** — H. J. BANKS DAVIS, M.B.—Male, aged 37. Tracheotomy was performed for laryngeal papillomata by Sir Charters Symonds, when patient was aged 6; since then he has had papillomata. The laryngeal symptoms were considerably aggravated during war service. The growths, which almost resemble nasal mucous polypi in their profusion, arise from the posterior surface of the epiglottis, the anterior commissure, the vocal cords and subglottic area. What is the prognosis now, and what is the treatment?

Dr D. R. PATERSON said he found that the best treatment for multiple laryngeal papillomata was removal with forceps. He had not heard that the expectations as to the value of radium had been fulfilled in these cases: in one American clinic it seemed to be regarded more as a danger than otherwise. If the affection had been present a long time, he did not think that much improvement in the voice could be expected, especially in a case in which papillomata were numerous.

Mr MARK HOVELL said that he had removed many papillomata by the indirect method, in some cases when the larynx was almost completely occluded. With regard to restoration of the voice, he had recently seen a male patient, who had had papillomata partially removed by Sir Morell Mackenzie. He (the speaker) had removed all the papillomata, and the removal was followed by complete restoration of the voice. The return to a normal voice gave rise on one occasion to some difficulty in identification of the patient in connection with claiming deeds, since he had previously been described as having a very hoarse voice.

Sir WILLIAM MILLIGAN said he pleaded for the use of radium in this case, and expressed surprise at Dr D. R. Paterson's remarks. He regarded papillomata in the larynx as locally infective; it was often difficult to remove them and keep the larynx clear. In some cases radium acted like a charm. Much depended on the way in which it was used; dosage was still somewhat empirical, but more exact than formerly. He exhibited a tube which he used for suspending the radium accurately in the larynx. He was so much impressed with the excellent results obtained, that he scarcely ever used anything else for these cases. He had now in preparation a new instrument designed to prevent the necessity for tracheotomy, and he would exhibit it at a future meeting. It was important in these cases to avoid cutting, tearing, or even cauterising instruments, because the resultant scarring might interfere with the voice.

Mr NORMAN PATTERSON inquired as to the dose of radium and the length of exposure which Sir William Milligan employed.

Mr HERBERT TILLEY asked what kind of screen Sir William Milligan used for the applicator. He also was surprised to hear Dr D. R. Paterson's

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remarks about radium, since he (the speaker) understood that it had given great satisfaction in American clinics.

Dr H. SMURTHWAITE asked whether Sir William Milligan used radium for these cases as a routine treatment, *e.g.*, would he employ it in the case of a solitary papilloma of the cord which could be removed in the ordinary way with fair probability of cure? He (Dr Smurthwaite) had a patient, aged twenty-six, who since three years of age had been voiceless. A year before, he had removed a large sessile growth with forceps; since the removal there had been no recurrence, and the voice was now fairly good.

Sir WILLIAM MILLIGAN said that the dosage of radium must be considered in relation to the nature and extent of the growths. If these were extensive, a large dose, 20 to 30 mg., should be applied for a short time, *e.g.* two hours. The screen he used was of silver or platinum. His remarks had been on multiple papillomata, not single growths. He would not say radium was his routine treatment for the condition, but it was a very valuable adjunct.

Mr H. J. BANKS-DAVIS (in reply) said that the patient, whom he first saw a year ago, was in the Civil Service, and his (the speaker's) opinion was asked as to whether there was a likelihood of the growth ever becoming malignant. The patient periodically coughed up papillomata, and thus temporarily obtained a freer airway.

**Specimen of Multiple Papillomata of the Nose**—H. J. BANKS-DAVIS, M.B.—Male, aged 64. Papillomata of twelve years' duration; frequent removals. The patient, whose case was reported by the exhibitor in 1912, shows identically the same condition now as he did then. The papillomata bleed readily. The exhibitor suggests radium treatment short of an extensive anterior nasal operation. *Pathological Report*.—Sections show a highly cellular papilloma of nasal epithelium. What is the prognosis now, and what is the treatment?

Mr G. W. DAWSON referring to the severity of these tumours, reminded members that Sir St Clair Thomson had stated that only about fourteen cases were recorded in the literature. He (the speaker) had shown a case at a meeting of the Section in 1918, in which the papilloma was attached to the septum. It was of hard consistency and purple in colour. There was no recurrence after removal. He again exhibited the specimen to-day.

Mr LAWSON WHALE reminded members that he also had exhibited before the Section, in 1922, a specimen of a large papilloma of the nose. He had searched the literature and found that they were extremely rare; he could only find three cases recorded, two of them in American literature.

Sir WILLIAM MILLIGAN said he would suggest, in this case, that half a dozen of Stephenson's minute tubes filled with radium should be embedded and left *in situ*.

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### **Ventriculo-chordectomy for Double Abductor Paralysis—**

WALTER HOWARTH, F.R.C.S.—Female, aged 45, married. The patient has been wearing a tracheotomy tube for the past twelve years, since an operation on the thyroid gland. The cords were completely adducted, and the ventricular bands always closely approximated. The voice was very weak.

Operation, 26th January, under suspension laryngoscopy: The whole of the right vocal cord was removed. It was not necessary to punch it away piecemeal, as when the anterior end was freed the cord tore away cleanly from the underlying muscle, just as if one were tearing the edge off a letter card. The attachment to the vocal process was cut through and the cord removed in one piece. The ventricular band was then punched away, particular attention being paid to the under surface. The tracheotomy tube was removed at the end of a week, and has not been worn since. The voice is a great deal stronger than it was before the operation.

*Further Notes.*—This case is not as yet completed. Since the agenda notes were written, there has been some contraction of the airway owing to the formation of a fibrous cord along the cut edge of the muscle. This will be removed. Members will note that removal of the ventricular band exposes the ventricle and enables one to look into it.

Dr IRWIN MOORE said that the operation which Mr Howarth had performed did not appear to be that which Chevalier Jackson had described as "ventriculo-chordectomy." Jackson's success consisted in punching out not only the ligamentous portion of the vocal cord, but also the muscular tissue constituting the supporting floor of the ventricle. Its non-removal would explain the want of initial success in the present case. Previous authors have shown that in removing the ligamentous portion of the cord alone, failure resulted from the formation of granulation tissue and cicatrices. Chappel (New York), in 1917, recorded the case of a patient, aged forty-five, upon whom he operated a few weeks after the onset of double abductor paralysis by removing with the aid of suspension laryngoscopy and scalpel and punch, the ligamentous part of the cord. The operation was a failure, insufficient breathing space being obtained, so he cut the opposite recurrent laryngeal nerve, which was followed by the cadaveric position of the cord, and three weeks later he was able to decannulate the patient. Chappel's case suggested that, in some cases, it might be advantageous, in the early stage of the disease, to consider the question of cutting the recurrent nerve, prior to more radical operation.

Mr E. MUSGRAVE WOODMAN congratulated Mr Howarth on what he had done. He himself had three weeks ago performed the external operation for chordopexy—as suggested by Dr Irwin Moore at the last meeting of the Section—on a case of double abductor paralysis, but at the moment it was not a great success. The operation was followed by prolonged and severe coughing. When viewed a week after the operation,

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the cord was seen in its new abducted position, but the glottic space anteriorly was largely blocked by granulations. He considered it important to avoid cutting away the small piece of cartilage, in which the anterior end of the cord was inserted, so as not to leave an opening in the thyroid cartilage through which granulations could protrude into the larynx.

Mr E. D. DAVIS said that he must congratulate Mr Howarth on the success of his operation, but he would like to see the patient again in three months, because in so many of these cases scar tissue formed, and reinsertion of the tracheotomy tube was necessary. He did not think there was sufficient room in the patient's larynx to breathe comfortably, and she was not now embarrassed because her tracheotomy fistula was still patent and was being used for respiration. One of Crile's colleagues treated these cases by raising a flap of mucous membrane above the cord, and another flap below, and after excising the vocal cord, he stitched the mucous membrane together. Very little scarring followed, and the results were said to be good.

Mr WALTER HOWARTH (in reply) said that he showed the case in a transition stage. The operation was performed only five weeks ago. It was not easy to get an idea of an operation unless it was seen performed. When he was in America, Chevalier Jackson was not doing these operations. He had written to Dr Jackson with regard to the operation, and had followed the description as carefully as possible. He had punched out the floor of the ventricle in the present case, and he thought that a sufficient scarring of the ventricular band had resulted. He did not remove enough of the vocal cord musculature, and there was now a fibrous cord impinging on the airway. Next week he intended to punch away the rest of the cord up to the thyroid cartilage; this would give sufficient respiratory airway. With regard to cutting the laryngeal nerve in early cases, the present case was not an early one; the patient had been wearing a tracheotomy tube for ten years, so that the procedure would scarcely be applicable. He would show the case again.

**Laryngostomy for Complete Subglottic Stenosis**—WALTER HOWARTH, F.R.C.S.—Male, aged 12, had worn a tracheotomy tube ever since a high tracheotomy for diphtheria in early life. The cricoid cartilage had been divided and had fallen in.

Operation, 1913: Laryngo-tracheostomy. The gutter into which the lower part of the larynx and the upper part of the trachea was converted was kept open for many months by the use of a large rubber tube, on to the back of which a sheet of oiled silk was sewn. The cavity was packed daily on to this and eventually the epithelium growing in from the surface covered the whole area. The epithelialised groove was then covered in by a plastic operation. Unfortunately the war intervened before the final operation, and the patient was lost sight of until a few months ago.

Sir WILLIAM MILLIGAN said that great skill and patience had been exercised over this case; the daily dressing for so long a time was very

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irksome. He asked whether the exhibitor had ever tried direct grafting in these cases, so as to avoid the constant dressing ; if so, had it succeeded ? He himself had tried grafting once, but it was a failure.

Mr E. D. DAVIS said he had once tried grafting in a similar case, but the graft soon came away. It would not adhere to the interior of the larynx.

Mr G. W. DAWSON said that one of his colleagues also had tried a graft, but it had not been satisfactory.

Dr BEEVOR said he was reminded of a case in which the trachea of a large dog had been used as a graft, and the operation succeeded very well. The death of the patient some time afterwards had been due to another cause.

Mr HOWARTH (in reply) said that he had not carried out grafting in this case, because when the operation had been performed ten years ago, grafting in the air passages was not so freely done as at the present time. If, in the future, he should have a similar case, he thought he would try direct grafting. He understood from Mr Harmer that there was a good chance of grafts succeeding in certain cases of this type.

**Hæmorrhagic Angiosarcoma of Upper Jaw**—H. J. BANKS-DAVIS, M.B.—Male, aged 60. After operation, recurrence took place. Growth apparently cured after three exposures to X-rays by Erlangen method (Dr Morton).

The patient was admitted for severe hæmorrhage following the "snaring of a nasal polypus" in another hospital out-patient department, two days previously. The cheek rapidly swelled, and an exploration of the antrum showed that it was occupied by a fleshy vascular growth, which expanded the bone even after a free curettage a few days before.

After the first exposure (eight hours' Erlangen apparatus), the swelling, hæmorrhage, and other symptoms disappeared. As a precaution, Dr Morton had thought it advisable to give him two more applications, and the patient's condition is as you see him now, apparently cured.

**Complete Laryngectomy for Malignant Disease**—WALTER HOWARTH, F.R.C.S.—Male, aged 54, operated upon a year ago. He is shown in the endeavour to combat the general belief that the operation is a very mutilating one and the patient always miserable. The pharyngeal funnel is well shown, but the pharyngeal voice is much poorer than usual.

**A Case of Sarcoma of the Nose cured by Radium**—E. MUSGRAVE WOODMAN, M.S.—Male, aged 30, first came under my care early in the year 1921. He then had a large swelling of the nose which had expanded the bone and deviated the axes of the eyes outwards. He was suffering from severe headaches.



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The interior of the nose appeared to be the seat of an extensive growth coming down from the base of the skull, which had destroyed the septum and pushed the bones of the nose outwards. A section showed it to be a myeloid sarcoma, which was inoperable. At that time no radium was available. The Wassermann test was negative. He had a course of colloidal selenium, but the condition gradually grew worse, the nose broadened and the skin became reddened, adherent, and infiltrated.

In December 1921, a barrage of four 10-mg. tubes of radium between the growth and the skin in different directions was given, and a 50-mg. tube placed in the substance of the growth. The condition gradually improved and he has had three further doses of radium. The nose has shrunk, the cavity is free from growth but tends to form crusts, and the man is well and at work.

Dr LOGAN TURNER asked how long the radium was kept in position in this case. He had had two or three cases of sarcoma of the nose and nasopharynx treated by radium, apparently with great success. The application was made in each case continuously for five days. The dose varied from 1700 to 2000 milligram-hours, and the pure salt was used, not emanation tubes. Dr Dawson Turner of the Radium Department, Edinburgh, was a supporter of long-continued applications.

Mr NORMAN PATTERSON said that he deprecated the use of the word "cure" in these cases when only a year or two had elapsed. He thought there were still some suspicious lumps about the base of the nose.

Mr J. F. O'MALLEY asked whether Mr Woodman had ever known destruction of bone to follow the use of radium. He recently had had a case which had been under treatment for two years, and the patient had seemed to be approaching a cure, and therefore was allowed to return home. A few weeks later he died of brain trouble, though there was no sign of recurrence in the nose.

Mr HERBERT TILLEY said that he also objected to the use of the word "cure" in these cases. He had seen a patient sixteen months before with a large sarcoma of the left ethmoidal region, proptosis of the eye on the same side, intense neuralgia, a blood-stained discharge, complete nasal obstruction, and tinnitus in the left ear, etc. Patient had been treated by the intensive X-ray method, and the condition disappeared in six weeks, so that he could breathe freely through both nostrils. Three months ago he (the patient) was suffering from indigestion, was getting very thin, and was found to have a growth in the stomach. It seems to be the almost universal experience that, while irradiation destroys the primary malignant growth, distant metastases occur later.

Mr MUSGRAVE WOODMAN said (in reply) that he considered that the word "cure" had rightly been criticised. It was forgotten, however, that this was not a case of round-celled sarcoma, but a giant-celled growth, and a myeloid sarcoma was the "plaything" of malignant disease. The lumps to which Mr Norman Patterson had referred had proved, under the

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microscope, to be granulation tissue. They were associated with some necrosed bone, which had followed the use of radium, and would separate so slowly that there would be a sufficient protection internally to prevent the danger of meningitis. The longest time he had left radium in position was twenty-four hours; each time 10 mg. were buried between the bones, and a 50-mg. tube inserted into the substance of the growth.

**Tuberculous Ulcer of the Dorsum of the Tongue**—WALTER HOWARTH, F.R.C.S.—Male, aged 24. The patient suffers from pulmonary tuberculosis. There is a deep ragged ulcer in the tongue, of three months' duration, not causing any discomfort and healing under treatment. Masses of giant cells are seen in the section. Wassermann reaction negative.

**Extensive Lupus of Palate, Pharynx, and Larynx**—WALTER HOWARTH, F.R.C.S.—Female, aged 15. The patient has had several operations for cervical adenitis in 1918 and 1920; loss of voice for four months; no pain or discomfort. There are some signs of pulmonary tuberculosis.

**Laryngeal Case for Diagnosis**—H. BUCKLAND JONES, M.B.—Male, aged 42, complains of hoarseness, which started about January 1922. He attended a chest hospital recently for about two years. Sputum examined, negative; is losing weight.

**Tuberculoma of the Pharynx**—NORMAN PATTERSON, F.R.C.S., and G. C. CATHCART, M.D.—Female, aged 46, complains of a lump in the back of the throat and a swelling in the neck; duration of trouble uncertain. The patient's posterior pharyngeal wall is occupied by a very extensive irregular swelling presenting a granular appearance. A portion removed showed the condition to be tuberculoma. Examination of the chest negative. Radiographic report: "A few calcareous nodules at the hilum of the right lung; no evidence of pulmonary disease.

Mr H. J. BANKS-DAVIS remarked that Mr Howarth, in his first case, referred to "healing under treatment." He (the speaker) considered that the best treatment for tubercular ulcers on the tongue was the application of pure chromic acid. If there was pain, the chromic acid formed an albuminate over the tongue and quickly relieved the pain. Again the chromic acid, if applied full strength, healed up the ulcer rapidly. Anything less than a 40 per cent. solution, he thought, would not have the effect he referred to.

Sir ST CLAIR THOMSON, referring first to the case of tuberculous ulcer of the tongue exhibited by Mr Howarth, said that an annotation had appeared in the *Lancet* last year stating that this was one of the most rare complications of pulmonary tuberculosis, and that the ulcerative form only occurred in advanced cases and was nearly always fatal. He exhibited the drawing of a similar case in a male patient who was admitted to a sanatorium

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with tubercle bacilli in his sputum: it was a "three-lobar case." He was also suffering from tuberculosis of the larynx. The Wassermann reaction was negative. The drawing showed the favourite site, viz., on the tip and sides of the tongue. As the *Lancet* remarked, these lesions were more common in men than in women. He gave this man, in 1917, a solution of chromic acid, 20 gr. to the ounce, to use as a paint. After his regulation three months in the sanatorium, his condition was *in statu quo*. Examination of the patient last year showed that the tongue and larynx were healed. Patient walked, cycled, and dug now, and he had been accepted for insurance as a first-class "life." Mr Howarth's second case was an extensive case of lupus, and he thought the quickest cure was to do a tracheotomy; the resultant rest would greatly benefit both larynx and pharynx. He also recommended the galvano-cautery and sanatorium treatment. Referring to the case shown by Mr Buckland Jones, he (Sir St Clair Thomson) thought it was a very promising one. He had seen cases of lupoid tuberculosis limited to the pharynx, in which no disease in the lungs could be detected. Frequently there were glands, which were not usual in laryngeal cases. Diathermy left an extensive scar, and half a dozen applications of the galvano-cautery would be better at monthly intervals.

Dr LOGAN TURNER said he thought that the base of the tongue in Mr Howarth's case of extensive lupus of the palate, pharynx, and larynx, was infected. It was very rare to see lupus of the tongue. Though he had seen many cases of lupus, he had only once seen the tongue involved. The epiglottis was diseased in a large number of cases.

Sir WILLIAM MILLIGAN said he supported the plea for rest in this type of case, and advised not only that the larynx should be given physiological rest by performing tracheotomy, but also that the patient should undergo the "silence cure" just as if it were laryngeal tuberculosis. He had found "silence" of value in carcinoma of the larynx, in improving the condition for a time, and it was of value in almost every laryngeal condition. In some of these lupus cases he had had good results from tracheotomy, and in others from the application of the galvano-cautery. He believed also that Mr Buckland Jones's case was tuberculous.

Mr HERBERT TILLEY said he would suggest that if the proposed measures failed, tuberculin should be tried, and related the case of a young girl who had had various measures used for this condition, including punching out portions of the anterior pillars of the fauces. Recurrence took place on the upper surface of the soft palate. It then spread down to the epiglottis and larynx. In despair of surgical treatment he suggested tuberculin, and it was continued for three months. At first the reaction was severe, but gradually became a diminishing feature, and after six months it was impossible to see any sign of disease in the whole area which had been implicated. He had never seen a case of the kind so dramatically cured.

Dr H. SMURTHWAITE said he had had a case which had been much benefited by rest to the voice, following tracheotomy for acute stenosis. The larynx had been blocked with tubercle and there had also been a

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secondary infection, which might have been responsible for the acute stenosis. In three months the condition had cleared up, except from the interarytænoid region. There had also been marked tuberculosis of the left lung, and the patient was sent to a sanatorium, but he (Dr Smurthwaite) did not know the later results.

Dr W. H. JEWELL said that seven years ago he had seen a case of lupus of the larynx in which he had to perform tracheotomy. The cords were so glued together that they constituted a complete diaphragm, which still existed, except for a small perforation, and the tracheotomy cannula had to be continually worn. Five years ago, under suspension laryngoscopy, he attempted to separate the cords, but found them so firmly adherent that only a small opening could be made, and this has since remained patent. He thought that the opening could be still further enlarged now that the lupus was cured.

Mr NORMAN PATTERSON (in reply) said that he considered the swelling on the left side of the neck in his case was not an enlarged gland, but a sebaceous cyst, because it was attached to the skin, was freely movable, and had a long history. He would remove the swelling and have it examined microscopically.

Mr HOWARTH (in reply) said that in the case of tuberculous ulcer on the dorsum of the tongue, he had merely applied 2 per cent. iodine in spirit. The patient had been to one sanatorium, and was in Victoria Park Hospital, waiting for admission to another. The lupus case was now in hospital for pulmonary tuberculosis. He would suggest tracheotomy to the patient, for the purpose of securing rest to the part. It should not, however, be forgotten that these cases showed a great tendency to get well of themselves. Ten years ago he showed a similar case which cleared up entirely on being sent to Margate and given good food for a period of several months.

**Improved Antrum-exploring Trocar and Cannula**—H. M. WHARRY, M.R.C.S.—This is a modification of the ordinary straight trocar and cannula, having two improvements.

(1) The point is guarded by having a small ring placed round the cannula half an inch from the end. The ring is very small and does not interfere with manipulation, but when it meets the medial wall, effectually prevents the point of the trocar from hitting or transfixing any of the other walls of the antrum at the moment of puncture.

(2) There is an improved joint between the cannula and the nozzle. By means of this the two can be held firmly together by the finger and thumb, making it impossible for them to fly apart when pressure is exerted by the syringe. The fingers can also be held out of the way of any discharge coming from the nose.

Mr HERBERT TILLEY wished to give a warning with regard to the blowing of air into the sinuses before irrigation of a sterile fluid, because a patient might die in one's consulting room from air embolism, owing to air being injected into one of the blood-vessels of the mucous membrane.

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In one case in which this occurred, the patient fell from the chair, and had a right-sided motor paralysis with aphasia lasting for twenty minutes. Fortunately the patient recovered. Nine deaths had been recorded as due to air embolism.

Mr W. H. JEWELL spoke of having heard of a case of death in a consulting room following the practice just referred to.

Sir ST CLAIR THOMSON said he had been taught in Vienna to first blow air through the cannula, and he had never seen an accident from the procedure. Was it certain that none of the cases mentioned were due to cocaine intoxication? It would be important to settle whether air really was responsible.

Mr CAVENAGH asked how much air was required to cause embolism. Even if one began irrigation with fluid immediately, some air was present in the cannula, and would that not be sufficient to cause an embolus? With regard to the improved antrum trocar and cannula, he remarked that no one would attempt to puncture dense bone without careful calculation of the distance, and by means of the finger, grasping and steadying the shaft of the trocar, thus to avoid any accident. He considered it doubtful whether the small shoulder of the new cannula was sufficient to dispense with this precaution.

Mr C. A. PARKER (President) said he had known two instances of accident occurring in cases of atrophic rhinitis, with a very small antrum. In both, the cheek had been wounded, and, in one, an abscess had resulted followed by some necrosis of the lower plate of the orbit. It was an accident that was not altogether rare.

**Case of Ulceration of Palate and Fauces**—T. JEFFERSON FAULDER, F.R.C.S.—This case was presented at the December meeting by Dr Kelson and Dr Thornhill. The Wassermann reaction was negative. The ulcers of the palate and fauces, three in number, have healed rapidly under simple treatment of thyroid extract and potassium iodide. The patient is putting on weight. The dysphagia, which was a symptom, has been proved by observation in the wards to be partly a neurosis.

**Specimen of a Large Cyst of the Orifice of the Larynx, arising from the Arytæno-epiglottidean Fold**.—E. D. DAVIS, F.R.C.S.—(The case will be reported *in extenso* in the *Journal of Laryngology*, in a paper on Cysts of the Larynx.)

**Case of Outgrowth from the Ventricle in a Subject of Pulmonary Tuberculosis**—Sir JAMES DUNDAS-GRANT, K.B.E., M.D.—Female, aged 19, seen in January 1922, on account of hoarseness of six months' duration. A smooth, reddish, rounded outgrowth projected from the anterior part of the left ventricle, lying on the surface of the vocal cord; the edges of the vocal cords were at that time irregular. She was ordered abstinence from the use of the voice,

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and the habitual wearing of a creasoted respirator. She has improved steadily, and there does not seem any call for more active treatment at the present time.

Dr IRWIN MOORE said he thought the outgrowth was a tubercular hyperplasia of a fold of mucosa lining the sacculus laryngis, as proved to be the case in a specimen in the Museum of Golden Square Hospital, which he had investigated along with Professor S. G. Shattock in connection with his paper on "So-called Prolapse of the Laryngeal Ventricle."

Mr CAVENAGH asked whether this was not a case of soft fibroma.

**Specimen showing two Foreign Bodies—one movable and the other fixed—in the Trachea of a Child, aged 3—H. J. BANKS-DAVIS, M.B.**—The fixed body was the cause of the symptoms, the movable body was the cause of death. This beautiful specimen, probably unique, was mounted by Dr Elworthy. It shows two fine, translucent flakes of bone from the scapula of a rabbit, which were inhaled during the act of swallowing. The scales of bone are shown in the specimen in the positions in which they were found—one above the tracheotomy opening and the other below it. Sudden death occurred after a fit of coughing. Bronchoscopy revealed nothing except paralysis of the left vocal cord, under which the upper scale of bone was impacted. The clinical history of the case is one of great practical importance.

**Specimen showing a Threepenny-piece impacted in a Perforation between the Œsophagus and Trachea of a Baby, aged 3 months—H. J. BANKS-DAVIS, M.B.**—Coin removed by tracheotomy, but death resulted. An X-ray plate was taken by Dr Morton who stated: "The coin is in the trachea, as it moves up and down on respiration."

When the size of a threepenny-piece is compared with the glottic aperture of a child aged three months, it seems to me impossible that the coin could have dropped through the air-way as stated. On passing a tube into the œsophagus I thought I saw the edge of the coin, but it disappeared on attempting to grasp it; on passing a tube into the trachea, I thought I detached the edge of the coin, but failed to secure it. The fact is that the coin was slipping through from the œsophagus into the trachea, and from the trachea into the œsophagus, and so eluded capture whenever an attempt was made from either locality to secure it. Eventually I removed the coin by a low tracheotomy when I observed the edge of the coin presenting in the tracheo-œsophageal wound.

The child died three days later, probably from œsophageal secretions draining into the trachea and causing broncho-pneumonia.

My colleague, Dr Irwin Moore, kindly assisted with his instruments in this case.

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Dr IRWIN MOORE referred to the rarity of this case, and to the value of the specimen for teaching purposes. In a paper which he had contributed to the *Lancet*, in 1919, he recorded the fact, from a search of the literature, that only thirty-seven coins had found their way into the air passages, during a period of nearly a century (from 1819 to 1915). Of these, twelve were impacted in the bronchi, and three in the trachea, the remainder being in the larynx, and he was unable to find a similar case to the one now reported, in which a coin had penetrated from the œsophagus into the trachea. One of the coins aspirated into the trachea was recorded by Chevalier Jackson, in 1915, in the case of a child, aged three, who had a nickel coin measuring 21 mm. impacted in the trachea for one day. It was surprising how a coin with this diameter could enter the trachea of a child of this age. In the case now recorded by Mr Banks-Davis, the insertion of a tracheotomy tube caused complete obstruction to respiration owing to displacement of the coin from the tracheo-œsophageal wall into the lumen of the trachea, and but for the immediate insertion of a bronchoscopic tube into one of the main bronchi, death would have occurred at the time. This case demonstrates the importance of having a bronchoscopic tube always ready as an alternative or adjunct to tracheotomy, in all cases of respiratory obstruction.

Mr BANKS-DAVIS (in reply) said the radiographer had reported that the coin "was in the trachea." He (the speaker) thought it impossible that a threepenny-piece could pass between the cords in so young a child; it did not occur to him that it had ulcerated through from the œsophagus and really occupied a portion of both passages.

**Clonic Spasm of the Palate**—DAN M'KENZIE, M.D.—Female, aged 29, after a prolonged attack of acute rheumatism, became aware of a "clicking" sound which seemed to be produced in the throat. Examination shows a regular clonic contraction of the soft palate, posterior and lateral pharyngeal walls, and base of the tongue, *i.e.*, of the muscles concerned in swallowing. The movement occurs about 150 times in the minute, and is most pronounced when the mouth is opened and the pharyngeal apparatus is, as it were, on the balance between normal rest and the act of retching. It is to be noted, however, that the movements occur also when the mouth is closed, and they have frequently awakened the patient when asleep. A possible relationship with the Eustachian clicking which seems to be the source of some types of audible tinnitus aurium occurs to one. The larynx is unaffected.

Dr C. O. Hawthorne, who has kindly examined the case for me, regards the symptom as a functional neurosis.

Mr W. H. JEWELL said he had shown at a meeting of the Otological Section the case of a child in whom the "click," due to spasm of the soft palate, could be heard two yards away. After removal of adenoids the "click" disappeared.

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**Tracheal Obstruction due to (?) Arrest of Development of the Trachea**—C. A. SCOTT RIDOUT, M.S.—The case was reported at the meeting of the Section on 2nd December 1921.\* The patient died in May 1922. The parts removed post-mortem were shown at the meeting of the Section on 3rd November 1922.†

*Further Investigations as to the Cause of the Obstruction and Report* by Professor S. G. SHATTOCK, F.R.S.—The larynx and trachea, etc., of a boy, aged 16. The thyroid gland is uniformly enlarged, the right lobe measuring 10 cm. (4 in.) in the vertical diameter; superiorly it extends to the level of the hyoid bone. The left lobe reaches slightly lower than the right, and to within half an inch of the bifurcation of the trachea. The trachea in consequence of the pressure of the goitre is flattened from side to side for a distance of about  $1\frac{1}{2}$  in.

Immediately below the goitre there is a voluminous, lobulated mass of enlarged lymphatic glands; some of these are discrete; others coherent. Inferiorly, the mass completely fills the cleft between the bronchi. On the anterior aspect occupying a median interval in the gland mass, there is a small portion of the normal thymus—a loose, delicately lobulated, soft structure of brownish pink colour. On the right side the upper portion of the thymus is enlarged by diffuse growth, which has almost destroyed its natural lobulation, and seeing that this consists of lymphatic tissue, may be regarded as a lympho-sarcoma. The most enlarged portion of the thymus (about the size of a tangerine orange) lies immediately below the right lobe of the thyroid, and against the right wall of the right bronchus, which it aids in distorting. Portions of the thymus on the left side are enlarged to a lesser degree, in the same manner, and lie in front of the left bronchus in the compression of which they likewise take part.

\* *Journ. of Laryngology and Otology*, 1922, p. 147.

† *Ibid.*, February 1923, p. 90.



## ABSTRACTS

### EAR

*The Treatment of Suppurative Otitis Media with Small Perforation of Tympanic Membrane.* Dr THEODORE VON LIEBERMAN, Buda-Pesth. (*Wiener Klinische Wochenschrift*, 15th March 1923.)

Lieberman deprecates the method of treatment of middle-ear disease advocated in nearly all text-books, of enlarging perforations in the drum for the purpose of medication of the tympanum, as this causes a collection of blood in the tympanum and favours the ingress of fresh micro-organisms.

He does not believe in attempts at medication of the middle ear through the Eustachian tube, as this causes a collection of secretion which prevents the lotion reaching the tympanum. He himself fills the meatus with the lotion of choice, and closes it by pressure on the tragus or by the nozzle of the Politzer bag and instructs the patient to swallow repeatedly. In this way the lotion reaches the tympanum and finds its way into the Eustachian tube and even into the pharynx. This method can be used with the smallest of perforations, unless the membrane is swollen and cedematous or the perforation is blocked by granulation tissue. These conditions are treated by alcohol or salicylic acid and by chemical or electric cautery, and then by intratympanic medication.

In early cases the author uses as his lotion of medication a solution of peroxide of hydrogen and later a mixture of peroxide and alcohol. In chronic cases he uses the latter alternately with a 1 to 2 per cent. solution of silver nitrate.

F. C. ORMEROD.

*Herpes Zoster of the Seventh and Eighth Cranial Nerves.* A. BLOCH, Paris. (*Annales des Maladies de l'Oreille, du Nez, du Pharynx et du Larynx*, February 1923.)

A case is described in considerable detail, the gist being as follows:—

1. Signs of general infection, fever, headache, and some meningeal reaction shown by lymphocytosis in the cerebro-spinal fluid.
2. Herpetic eruption in a well-defined skin area.
3. Peripheral facial paralysis of the same side.
4. Auditory disorders—tinnitus and some loss of hearing with vestibular disorganisation, giddiness, vomiting, spontaneous nystagmus and vestibular hyperexcitability.

GAVIN YOUNG.

## Abstracts

*Contribution to the Pathological Anatomy and Pathogenesis of Deaf-mutism.* II. "Post-hydropic Degenerative Changes in the Internal Ear as a Cause of Deaf-mutism." O. STEURER, Jena. (*Zeitsch. f. Hals- Nasen- und Ohrenheilkunde*, Bd. II., p. 172.)

The basis of this article is Wittmaack's view that "dropsical" increase of endolymph occurs as the result of increased secretion, but chiefly of diffusion. Two cases of his own and 10 of other authors are described and illustrated. He considers that the conditions found are regressive degenerative changes rather than developmental defects. Out of the 10 cases of other authors, 7 were considered developmental defects, 2 cases of intra-uterine labyrinthitis and 1 labyrinthitis caused by meningitis. Steurer is of the opinion that many cases of deaf-mutism must, in the light of our present-day knowledge of the pathological anatomy of the ear, be interpreted as regards their genesis, in a different way to that adopted by their describers. Above all, the number of those attributed to developmental defects and malformations must be greatly diminished in the light of our knowledge of the origin of degenerative changes in the internal ear.

JAMES DUNDAS-GRANT.

*Deaf-mutism: Etiology and Prophylaxis.* Dr JOUET. (*Bulletin d'Oto-Rhino-Laryngologie*, Paris, March 1923.)

The author reviews the present state of our knowledge on this subject, in the light of statistics of 750 cases (institutional). Congenital and acquired causes are present in almost exactly equal frequency.

1. Consanguinity, once thought to be of greatest importance, is found to account for 8 per cent. only. It is rare to find more than one case in a family.
2. Heredity. Inter-marriage between deaf-mutes is frequent, only 10 cases however were found in which either parent was deaf-mute: 2 cases had deaf-mute grandparents.
3. Syphilis of parents is important. Of cases in children presenting *no other* sign of syphilis, 10 per cent. of the deaf-mutes had syphilitic parents.
4. In over 60 per cent. of cases the etiology is unknown: the disease is commoner in mountainous areas.

Acquired disease:—

5. 43 per cent. are due to meningitis, chiefly cerebro-spinal.
6. 20    "        "        late congenital syphilis.
7. 30    "        "        exanthemata.
8. 4     "        "        trauma (fractured base, etc.).

## Ear

In addition to the obvious prophylaxis directed to consanguinity and syphilis, Dr Jouet advises :

(a) Systematic disinfection of nasal fossæ at birth.

(b) Surgical treatment of adenoid hypertrophy at any age.

E. WATSON-WILLIAMS.

*Is Adult Lip-reading Worth While?* Dr G. BERRY.

(*Laryngoscope*, Vol. xxxii., No. 9, p. 645.)

The results of teaching 108 deaf American soldiers are given. No one who could hear conversation over five feet was admitted. Many were totally deaf. Each case received an intensive course of three lessons of forty-five minutes each, daily. Individual tuition was found to be essential. The results are graded, excellent, good, average, fair, and poor. The course for the "excellent" averaged 2.1 months, and in that time they were able to read 90 to 100 per cent. of what was said; while the "excellent" and "good" together could read 80 per cent. The "poor" averaged six months, but the average for all cases was only 2.7 months. Among the "excellent" were 13 totally deaf and 10 hearing a shout only. A good education was not necessary, in fact the poorly educated seemed to do even better in this series. The "poor" grade shows a preponderance of totally deaf, but this is explained by the sluggish mentality of the meningitic deaf. The system was an army one and the pupils under complete military control. Civilian schools compare badly with the above results, probably owing to the long intervals between lessons and lack of sufficient control.

ANDREW CAMPBELL.

*A Case of Streptococcal Meningitis.* S. G. ASKEY.

(*Lancet*, 1923, i., 952.)

The author records the case of a boy of 12, with an adenoid history. On 22nd January 1923, he had earache and right deafness. Beyond slightly tender glands about the right sterno-mastoid, symptoms were negative. 29th January: severe occipital neuralgia; pulse and temperature normal. No mastoid tenderness. 3rd February: sudden vomiting with cessation of neuralgia, temperature 103.5°, pulse 108, no other signs. In the evening, Kernig's sign present, neck muscles rigid, knee-jerks absent. No other symptoms. Cerebro-spinal fluid turbid under reduced pressure; yielded pure culture of streptococcus. 4th February: operation, small area of diseased bone at mastoid tip, pus in cells and antrum; dura mater not touched. Immediate improvement and uninterrupted recovery.

MACLEOD YEARSLEY.

# Abstracts

## PHARYNX.

*Chronic Infection of the Tonsils by Fusiform Spirilla.* Drs SEQUIN, BOUCHET, AND LOGEAS, Laënnec Hospital. (*Annales des Maladies de l'Oreille, du Larynx, du Nez et du Pharynx*, February 1923.)

The subject is treated very thoroughly, and is divided into three parts—Histological, Clinical, and Treatment. The conclusions arrived at are:—

1. These organisms cause chronic tonsillitis affecting particularly the crypts: the parallel is drawn between the infection of the gums and that of the tonsils, the treatment of both being difficult to carry out successfully.

2. Chronic fuso-spirillar tonsillitis causes destruction of the epithelium, and ulceration of the superficial lymphoid tissue. The squamous epithelium becomes thickened, forming a kind of leukoplakia.

3. In Vincent's angina, spirochaetes and fusiforms invade the tonsillar tissue, destroying it, and this stimulates a polynuclear invasion of the tissue. In chronic tonsillitis of the fuso-spirillar variety, there is no polynuclear influx, lymphocytes alone being present. These areas of ulceration are difficult to eradicate. They predispose to re-infection of the tonsil and to repeated attacks of acute tonsillitis.

Treatment with arsenobenzol glycerine is suggested for the milder cases, enucleation for the more severe. GAVIN YOUNG.

*Persistent Cranio-Pharyngeal Canal.* Dr PILPEL. *Monatsschrift für Ohrenheilkunde Laryngo-Rhinologie*, Vol. ii., 1922.

A small, very thin, pale girl of three was admitted to the Children's Hospital of Leopoldstadt on the 18th of July 1920. She was unconscious, cried if disturbed, but could not be "roused." Pupils unequal; marked trismus; extreme rigidity of neck; opisthotonus; positive Kernig and increased reflexes.

Except for rather backward development, and an attack of measles, there was nothing important in her history. On account, however, of continued snoring and mouth breathing, an operation for adenoids had been performed at another hospital six days previously. The following night she had fever and vomiting. The neck stiffness had existed for three days, since when the child had taken no food.

Lumbar puncture revealed a slowly flowing, very turbid fluid, which contained numerous pus cells, various cocci and bacteria. The following day the child died. *Diagnosis.*—Purulent meningitis. Post-mortem examination showed a purulent inflammation of the meninges, especially at the base, with an empyema of the ventricles.

# Pharynx

After removal of the brain, a large defect was found in the body of the sphenoid bone, where in place of the sella turcica there was an oval hole, measuring 21 by 14 mm., in which brain tissue lay. Further investigation showed that the pharyngeal end of this hole was merely closed by damaged periosteum, and the infiltrated mucous membrane of the pharynx.

The author considers that the meningitis was the direct result of the previous operation.

He gives a résumé of the literature he has been able to find of this abnormality, and it is with some surprise one reads a report of over two hundred cases—recorded by different investigators—where this condition (which he states is one of the commonest maldevelopments) apparently was found in some 10 per cent. of bodies examined. The subject is discussed at length with a note on the normal development of the pharyngeal hypophysis, its blood supply, and the connections of this with the intra-cranial vascular system, raising in addition interesting speculations as to possible association between this part of morphology and the development of adenoids.

ALEX. R. TWEEDIE.

## *The Kidneys and Tonsillar Infection.* E. CAUTLEY.

(*Archives of Pediatrics*, February 1923.)

Acute nephritis is frequently caused by an infection via the tonsils and should be treated by tonsillectomy. The attacks of hæmaturia or albuminuria are usually ascribed to "chill" and, though comparatively mild, are apt to recur.

A significant fact in etiology is that one of the functions of the kidney is the excretion of organisms and toxins. Such excretion may take place without nephritis. If nephritis does occur, it is not of necessity severe, and indeed a mild degree of albuminuria throughout life is compatible with excellent health. It is important to search for a focus of infection, especially in the tonsils. Two cases are described in which enucleation of the tonsils was followed by rapid disappearance of the symptoms.

DOUGLAS GUTHRIE.

## *Observation on the Results of Roentgen Therapy in Chronic Tonsillitis.*

JAMES W. BABCOCK, M.D., New York. (*Journ. Amer. Med. Assoc.*, Vol. lxxx., p. 5, 3rd February 1923.)

A summary of the results observed in a series of cases so treated occurring in the practice of Dr C. G. Coakley and the Author, forms the basis of this instructive paper.

The enthusiastic claims of some advocates of this method of treating chronic inflammation of lymphoid tissue, particularly the tonsils, has been very thoroughly examined. Witherbee's claims are

## Abstracts

set forth in detail. Lederer's paper on the Roentgen Ray in Tonsillar Disease (*Journ. Amer. Med. Assoc.*, Vol. lxxix., p. 1130, 30th September 1922) is also quoted.

The Author's observations lead to the conclusion that though roentgen therapy, as now advocated, may cause diminution in the size of tonsils or other lymphoid tissue in the pharynx or naso-pharynx, the residue has been observed acutely inflamed, and much increased in size while inflamed. It has been demonstrated that the small fibrous tonsil is as likely to serve as a focus of infection with remote symptoms. The observations on tonsils afterwards excised indicate that they are not made free of pathogenic bacteria, there is no evident increase in connective tissue, diminution of lymphoid tissue, or lack of activity of the germinal centres of widening of the crypts. Neither the adenoids nor the hypertrophic lymph nodules on the posterior wall of the pharynx disappear, they do not change in any appreciable way, and are subject to occasional inflammations similar to those preceding roentgen therapy. General symptoms, involving the heart and joints, have not been relieved in these cases by roentgen therapy, and, in some of the cases, have improved following an operation some time after roentgen therapy.

Until it is more definitely shown that diseased tonsils and other lymphoid tissue in the pharynx and naso-pharynx can be eradicated as efficiently by a less unpleasant process, reliance must be placed on surgery.

PERRY G. GOLDSMITH.

*Nine Cases of Pulsation Diverticulum (Zenker).* VIGGO SCHMIDT.  
(*Acta Oto-Laryngologica*, Vol. v., fasc. 1.)

Details are given of 9 cases of pharyngeal diverticulum together with an account of the pathology, ætiology, and symptoms of the condition. It is pointed out that in many cases there is present some debilitating disease unconnected with the œsophagus, and that this may play an important part in the formation of the diverticulum "through the general weakening of the nervous system and loss of muscle tone." External œsophagotomy with excision of the sac was performed in 4 cases, in 2 with success. The other 2 were poorly-nourished individuals with chronic nephritis who stood the operation badly and died some little time after it. In 2 other cases Goldmann's operation was successfully employed. This consists in exposing and freeing the diverticulum, and tying the pedicle with a thick silk ligature which drops off together with the gangrenous sac at the end of about a week. The wound, occupied by the ligatured sac, is packed so that, adhesions having formed, the development of an œsophageal fistula, when the sac drops off, is never followed by serious infection.

THOMAS GUTHRIE.

# Peroral Endoscopy

## PERORAL ENDOSCOPY.

*A Case of Leiomyoma of the Œsophagus.* E. A. GRÜNBERGER and A. PIJPER. (*Acta Oto-Laryngologica*, Vol. v., fasc. 1.)

A man, 54 years of age, suffered from difficulty in swallowing solids for four months before coming under observation. X-ray examination showed almost complete obstruction just below the manubrium, a thin stream only passing through. Œsophagoscopy revealed normal mucous membrane, which at a distance of 20 c.m. from the teeth bulged into the lumen from in front and to the left, backward and to the right. What remained of the lumen was crescentic in shape and would not admit the thinnest probe. Some temporary improvement followed, but a few weeks later the obstruction became complete even for fluids, and a gastrostomy was performed, the patient dying some days after the operation. The post-mortem examination showed the mucous membrane normal throughout. The muscular coat was somewhat thickened as a whole, and contained at certain levels rather hard masses, microscopic sections of which showed them to consist of very young unstriated muscle fibres. The staining reactions confirmed the view that the tumour must be regarded as a leiomyoma.

THOMAS GUTHRIE.

*Carcinoma of the Œsophagus with Perforation of the Aorta.* JOSEPH J. MAYER, M.D. (*Journ. Amer. Med. Assoc.*, Vol. lxxix., No. 18, 14th October 1922.)

Female, aged 47, an Austrian, complained of inability to swallow solids, though fluids would pass if small amounts were swallowed slowly. Regurgitation of food had been going on for two months, but was thought by the patient to be vomiting of undigested food. There was pain behind the sternum and in the stomach, with progressive weakness and loss of weight. The Wassermann reaction was negative. Roentgen-ray examination revealed an irregular stricture of the œsophagus two inches from the top of the sternum. Gastrostomy was performed and was followed by an improvement in general condition sufficient to permit her going about the ward. One month after the operation, directly after getting into bed, she was found gasping for breath and died in a few minutes. There was no bleeding from the mouth. Necropsy revealed a fibrous malignant growth of the gullet, three inches in length, opposite the bifurcation of the trachea. The lumen would only admit a small-sized probe, and in the centre of the growth was an ulceration the size of an ordinary lead pencil which invaded the aorta. The stomach was filled with blood. No metastasis or other abnormality was found.

PERRY G. GOLDSMITH.

## Abstracts

*The Early Treatment of Œsophageal Stricture.* Prof. HANS SALZER.  
(*Wiener Klinische Wochenschrift*, 19th April 1923.)

Following a previous communication Professor Salzer considers the best method of treating stricture of the œsophagus is to begin dilatation three to six days after the onset of obstruction or as soon as the swelling of reaction has subsided, not waiting for the lapse of six to eight weeks as usually recommended, for by that time a hard cicatrix has formed and makes dilatation much more difficult. Of 24 cases of stenosis in the last three years 21 were cured, 2 died before treatment was commenced and one died of broncho-pneumonia after four dilatations. The most severe cases of stricture were dealt with at an early date without perforation, though this is an accident which has always to be guarded against.

Of a complete total of 37 cases treated, 33 were cured, and several which have been observed over periods of three years and more are quite healthy.

In Hungary the prevalence of œsophageal stricture in children is very striking, accounting for 6 per cent. of the cases at some of the children's clinics. Bokai treated 78 cases by this early method with 4 cases of perforation and 72 cures.

Early dilatation has been so successful with children that the author recommends its being applied to similar cases in adults, an opportunity of doing which he has not yet had.

F. C. ORMEROD.

*Two Cases of Cancer of the Œsophagus detected at an Early Stage by Œsophagoscopy.* E. BRATTSTRÖM. (*Acta Oto-Laryngologica*, Vol. v., fasc. 1.)

The idea is widely prevalent that in cases presenting symptoms suggestive of cancer of the œsophagus, the first proceeding should be an X-ray examination, and that if this gives a negative result it is safe to assume the absence of serious disease. In the two cases recorded in this paper, however, œsophagoscopy with excision of a specimen proved the presence of a malignant growth in each, at a time when radiography failed to show any definite evidence of œsophageal disease, although the symptoms (pain and obstruction) had been present for some months. It is inferred, therefore, that no reliance should be placed on the absence of X-ray evidence of disease, and that an early resort to œsophagoscopy will not only settle the diagnosis but, if a growth be found, enable treatment by radium to be carried out at an early stage.

THOMAS GUTHRIE.



# Peroral Endoscopy

*Late Results of Radium for Cancer of Œsophagus.* Dr J. GUISEZ.  
(*Bulletin d'Oto-Rhino-Laryngologie*, Paris, November 1922.)

Dr Guisez divides his observations into three groups:—

1. Early cases (3) in which apparent complete cure followed treatment. The oldest cases had survived eleven years from treatment.
2. Late cases with large tumours (4). Disappearance of all signs of tumour, but some cicatricial stenosis. All cases improved very much and survived at least three years.
3. Cases too recent for any deduction as to permanence of cure; rapid improvement of symptoms has followed the technique recently developed.

The author regards tumours of either extremity of the tube unfavourable. Extreme cachexia renders improvement doubtful. Otherwise, any case should be treated in which a lumen can be discovered. Hyperplastic and bleeding growths render the treatment more difficult to apply, but the type of growth has no prognostic significance. About 10 centigrams of radium bromide is used in two or three tubes. A screen of 1.5 mm. platinum and 1 mm. silver is used, and the whole enclosed in a gum-elastic tube, with a wire style. A long tube has been found the only satisfactory means of fixing the radium for a protracted seance. Five or six applications of ten hours each should be considered a minimum treatment. The normal tissues are not affected by this method.

E. WATSON-WILLIAMS.

## REVIEWS OF BOOKS

### *La Röntgenthérapie des Tumeurs Malignes en Oto-Rhino-Laryngologie.*

Drs GEORGES PORTMANN and A. P. LACHAPÈLE (Bordeaux).  
Paris: A. Maloine et Fils, 1922.

An extremely valuable monograph, based on twenty cases treated entirely by X-rays. Accurate microscopic diagnosis is insisted on as a preliminary, in spite of certain dangers. All the tumours treated were pronounced inoperable, usually by surgeons of repute, but one cannot help feeling that some of them might have been dealt with by diathermy. This applies particularly to the tongue and tonsil cases. The technical details are extremely clear, even to readers unfamiliar with X-ray work. The applications were all made to the outside of the neck, and whenever possible "feux croisés" were made use of, particularly in laryngeal cases. The tendency is towards few applications lasting as long as an hour, and maximum dosage compatible with safety to normal tissues.

Analysis of the results shows a complete failure of X-rays against epithelial tumours. On the other hand, of ten cases of sarcomata, seven are "cures" (only since 1920). No excessive claim is made for X-ray treatment at its present stage of development, and the whole pamphlet shows an admirable moderation. J. KEEN.

### *Consultations Oto-Rhino-Laryngologiques du Praticien.*

G. PORTMANN. Pp. 247. Paris: G. Doin, 1922. 14 frs.

Dr Portmann in this small book gives a large number of prescriptions and formulæ for use in diseases of the ear, nose, and throat. Many of them are extremely useful, but we note with surprise the lavish use of cocain as a therapeutic measure in acute conditions, more especially as most of them are for the patient's own use. Moreover, eucaïne and stovaine are also used in children during acute conditions, a practice not without its risks and one which should certainly not be recommended for indiscriminate use by the practitioner. A method of intratracheal injection is described which is within the scope of every practitioner who is not familiar with the somewhat difficult intralaryngeal method. It consists in the injection of the fluid directly into the trachea with a hypodermic needle. A convenient form of nasal medication is in the form of pommades with vaseline as a base. A piece the size of a pea is placed in the nostril and aspirated into the nose.

J. K. MILNE DICKIE.

## Reviews of Books

*Kurze-Praktische Anleitung zur Erkennung aller Formen des Kopfschmerzes.* Dr LOBEDANK. Leipzig: Curt Kabitzsch, 1921.

A compilation which attempts to deal in tabular form with such a vast subject as the causes of headaches can, in the nature of things, be only moderately successful, and must be uninspiring. The author gives undue prominence to diseases of the eye, and deals comparatively scantily with nose and ear conditions. Rarer conditions, such as sphenoidal sinus disease, receive the same amount of emphasis in the arrangement as such extremely common causes of headaches as adenoids.

J. KEEN.

*Séquelles Oto-Rhino-Laryngologiques.* JEAN GUISEZ (Paris).  
Illustrated. Paris: J. B. Baillière, 1921.

This is the first of a series of volumes designed as a guide to the diagnosis and treatment of the late results of wounds and accidents incurred in the recent war. Although its teaching is founded on war surgery, it is well worth studying from the point of view of its bearing on the accidents and diseases of civil practice. The subjects are dealt with under three headings: the nose and nasal sinuses, pharynx, larynx, and trachea, and ear, respectively. In the section dealing with the nose and nasal sinuses, a general description is given of the diagnosis and treatment of sinus suppuration, and also an extensively illustrated description of the various plastic operations for the repair of internal and external nasal deformities. Under the heading of pharynx, larynx, and trachea, various cicatricial stenoses and laryngeal paralyses are described in detail. The effects of poison gas, both immediate and remote, on the upper air passages, are also fully dealt with.

In the section devoted to the ear, traumatic deformities of the external ear and their repair and the suppurative middle ear conditions which result from war injuries, are dealt with. The difficult question of the diagnosis of the degree and causation of deafness resulting from war injuries is fully discussed, and a detailed description is given of the various functional labyrinthine examinations and their bearing on the differential diagnosis. The question of the fitness for military service and degree of disability for pension assessment receives considerable attention, but, being written from the French standpoint, the results are not wholly applicable to this country.

A. J. WRIGHT.

## OBITUARY

JAMES COUBRO POTTER, M.B., C.M., F.R.C.S. (EDIN.).

Surgeon, Metropolitan Ear, Nose, and Throat Hospital,  
Fitzroy Square, W 1.

THE sudden and unexpected death, on 16th April, from cerebral hæmorrhage, of Mr Coubro Potter, at the early age of fifty-four, previously notified in our columns, came as a great shock to his many friends and colleagues.

By his death the ranks of British laryngologists and otologists—so recently suffering from the loss of Hunter Tod, James Donelan, Nixon Biggs, and Charles Bean—have been still further depleted.

Mr Coubro Potter was the son of John Potter, Esq., shipowner, of Fenchurch Street, E.C., and Linden Gardens, W., and was educated at the Edinburgh Academy. He entered Edinburgh University as a medical student, where he graduated M.B., C.M., in 1893, receiving the degree of M.D. with Honours in 1900.

Commencing his career as house-surgeon to the Belgrave Hospital for Children, he settled down in general practice and for some years carried it on successfully in the north-west of London. Later, he decided to study diseases of the throat and ear. In pursuance of this object, he joined the Metropolitan Throat Hospital as clinical assistant under Dr Pegler, and soon showed great ability, and a faculty for quickly mastering the details of operative work. As vacancies occurred he passed rapidly from the posts of clinical assistant, anæsthetist, and assistant surgeon, to a place on the senior staff. In 1915, he obtained the Diploma of Fellow of the Royal College of Surgeons (Edin.), and, immediately after, was appointed Laryngologist to the Mount Vernon Hospital for Consumption.

At the outbreak of the Great War his patriotism displayed itself in immediately applying for active service, and he was greatly disappointed on being told that his services could be best employed at home. He was offered and accepted the appointment of Surgeon to the Ear, Nose, and Throat Department, Queen Alexandra Military Hospital, Millbank, and later received other military appointments.

With an immense store of energy and a great capacity for work, he threw his whole heart and time into military service at home. His interest and enthusiasm in this work became so great, that since the War he continued all his military appointments and devoted practically all his time to hospital work at the expense of his private practice, which latterly became of secondary consideration to him. There is no doubt that his strenuous work during the War, and afterwards carried



JAMES COUBRO POTTER, M.B., C.M., F.R.C.S. (Edin.)

*(No recent photograph is available for reproduction. The above photograph was taken in 1905, when he was 36 years of age.)*



# Obituary

on without a break, undermined his constitution and was indirectly the cause of his premature death.

Dr Hemington Pegler, Consulting Surgeon to the Metropolitan Ear, Nose, and Throat Hospital, adds the following tribute to his memory :—  
“I have known Coubro Potter for twenty years, and cannot realise his death. He was very popular at the Fitzroy Square Hospital, and by his frequent attendance on its Committee contributed a great deal towards its prosperity. His cheerful and happy disposition made him a great favourite with the staff and patients. He was a familiar figure at the Meetings of the Section of Laryngology, Royal Society of Medicine, though his voice was seldom heard, and doubtless the prodigious amount of work which he undertook and performed so faithfully, prevented his communicating his valuable experience in surgery to current literature.”

Mr Buckland Jones, Surgeon to the Fitzroy Square Hospital, referring to Mr Coubro Potter's long association with that hospital, says :—“He devoted a large part of his time to the services of the hospital during the twenty years he was connected with it, and his cheerful and genial personality endeared him to all with whom he came in contact. He was very good at clinical work, and a most capable and successful surgeon. He always took the greatest interest in the administration of the hospital, and served for many years on the Committee of Management, the Medical Board, and the House Committee. His patients will miss a capable and considerate friend, and the staff an excellent and helpful colleague.”

Lieut.-General Sir T. H. John C. Goodwin, K.C.B., C.M.G., D.S.O., Director-General Army Medical Service, writes :—“Coubro Potter's death was very sad and unexpected. He is a great loss to the profession and we shall miss him very much at Millbank, where he held the appointment of Ear, Nose, and Throat Specialist at Queen Alexandra's Military Hospital from September 1914 to the day of his death. I saw a certain amount of his work personally, and saw him operate on several occasions. He was a charming man to work with as he was always so cheerful and anxious to help. He made many friends and will be very greatly missed.”

Lieut.-Colonel J. F. Martin, R.A.M.C., Commanding Officer Queen Alexandra's Military Hospital, writes :—“A first class man at his work, and blessed with a singularly cheerful disposition, he made many friends in the Army amongst his patients and his colleagues in the Royal Army Medical Corps, by whom he is sadly missed.”

Colonel E. L. Gowlland, Medical Superintendent of the Ministry of Pensions Hospital, Orpington, Kent, writes :—“The loss of Coubro Potter's services is felt very keenly here, where his genial personality was much appreciated by his medical colleagues and the whole staff,

## Obituary

as well as by the pensioner-patients, who benefited so much by his skilful treatment."

Mr E. C. Hughes, Assistant Surgeon to Guy's Hospital, and Surgeon Specialist to Queen Alexandra Military Hospital, writes:—"I first met Coubro Potter in 1916 at Millbank, where he was Specialist in charge of the Ear, Nose, and Throat Department. He made his department a conspicuous success, and to it the War Office referred a large number of doubtful and difficult cases. So satisfactory was his work, that the War Office retained him in active service right up to the time of his death. At the same time he was carrying on his appointments at civilian hospitals, for one of which—the Metropolitan Throat Hospital—he had a very great affection. After the War he added to his duties by becoming visiting aural surgeon to the Pensions Hospital at Orpington, and by sitting upon Pension Boards. These arduous duties were too much for him, for, in 1921, he was taken ill, and found to be suffering from high arterial tension. Though advised to be careful and reduce his work, he made light of it, and was soon back at full work. His optimism never left him. On the day of his death he was on his way to Millbank, and not feeling well, called at the house of a physician, where he had a cerebral hæmorrhage and passed away in a few hours. Potter loved his work, and the more work he did the happier he was; in fact, his appetite for work surprised me when I first met him. He loved his home life, and the atmosphere of his home was always associated with firm friendship and good fellowship. He will be much missed."

At the time of his death he held the appointments of Surgeon to the Metropolitan Ear, Nose, and Throat Hospital; Laryngologist to Mount Vernon Hospital for Consumption; Visiting Aural Surgeon to the County of London War Hospital; Laryngologist and Aural Surgeon to the Ear, Nose, and Throat Department, Queen Alexandra's Military Hospital, Millbank; Visiting Aural Surgeon to the Ministry of Pensions Hospital, Orpington; Consulting Aural Surgeon to the British Red Cross Society, County of London Branch, Paddington Division.

He was a Fellow of the Royal Society of Medicine, and Member of the Laryngological and Otological Sections, also a Member of the Harveian Society.

Though of late years he had not much opportunity for recreation or sport, in his earlier days he was well known as a keen and intrepid yachtsman on the Clyde.

He leaves a widow, the only daughter of John Young, Esq., of Glasgow, and of Allt-a-more, Argyllshire, and one son "Jack," a Flight Lieutenant in the Royal Air Service, of whom he was very proud.

IRWIN MOORE.



## GENERAL NOTES

BRITISH MEDICAL ASSOCIATION, PORTSMOUTH, 1923.

The Ninety-first Annual Meeting of the British Medical Association will be held at Portsmouth from the 24th to the 27th July inclusive, and will be presided over by Charles P. Childe, F.R.C.S., Senior Surgeon to the Royal Portsmouth Hospital.

The Sectional Meetings are arranged for the 25th, 26th, and 27th. The Sections of Laryngology and Otology have been combined and placed in the two-day Sections. Thursday, the 26th, has been allotted to Otology and Friday the 27th, to Laryngology.

The Office-Bearers are: *President*—Mr Ernest B. Waggett, D.S.O., London. *Vice-Presidents*—Mr Somerville Hastings, London; Mr A. J. M. Wright, Bristol. *Hon. Secretaries*—Mr H. Bedford Russell, 86 Harley Street, London, W.1; Mr George H. Ross, 28 Kent Road, Southsea.

The following Discussions have been arranged. "Internal Ear Deafness," to be opened by Dr Dan M'Kenzie on Thursday, 26th July, and "Spasm of the Larynx," to be opened by Sir St Clair Thomson on Friday, 27th July.

Those who are desirous of taking part in the Discussions are requested to make an early application to the Hon. Secretaries, as priority in speaking will depend largely upon the promptness of application.

Papers on topics of pressing interest are invited from Members of the Association, more particularly from the younger Members. No paper should take longer than fifteen minutes to read, and subsequent speakers will not be allowed more than seven minutes. The titles of the Papers, with rough copy notes, should be submitted to the Hon. Secretaries as soon as possible for approval by the Committee.

The Golf Competition at Portsmouth will take place on the afternoon of Thursday, 26th July. Competitors should communicate with Dr Harley Ross, 28 Kent Road, Southsea.

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The fourth Scandinavian Meeting of Oto-Laryngology will be held in Helsingfors on the 27th and 28th of July, 1923.

The following Papers will be discussed:—

"The Indications for Labyrinth Operation," by Professors G. Holmgren, of Stockholm and R. Bárány, of Upsala.

"The Importance of Local Anæsthesia in Oto-Rhino-Laryngology," by Dr N. Rh. Blegvad, of Copenhagen.

"The Surgical Treatment of Thrombophlebitis of Aural Origin," by Drs E. Knutson, of Gothenburg, and H. v. Fieandt, of Helsingfors.

Those who wish to make communications should address themselves to the Secretary of the Meeting, Dr H. v. Fieandt, St Robertsgatan 13, Helsingfors.

# General Notes

## THE SEMON LECTURE, 1923.

Dr A. Logan Turner, Edinburgh, has been invited by the Semon Lecture Board to deliver the Semon Lecture, University of London. The Address will be given in the Hall of the Royal Society of Medicine, 1 Wimpole Street, London, W.1, on the afternoon of Thursday, 1st November, at 5 o'clock.

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## THE JACKSONIAN PRIZE, 1924.

The Council of the Royal College of Surgeons of England has selected the following as the subject for the Jacksonian Prize Essay for 1924: "The Pathology, Diagnosis and Treatment of Oesophageal Obstruction."

Candidates must be Fellows or Members of the College, and not on the Council.

The Dissertations for the Prize for the ensuing year, 1924, must be delivered at the College not later than 4 o'clock P.M., on Wednesday the 31st of December of that year.

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## "QUERIES AND ANSWERS."

The suggestion has been made that it might prove useful to our readers, if an opportunity was afforded them, through the pages of the *Journal*, of asking for information regarding points of doubt or difficulty, which may, from time to time, arise in connection with their work.

It is proposed, therefore, to open a correspondence column, under the above title, and to take the necessary steps to supply the information that may be desired.

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## SOME FACTS AND REFLECTIONS: STOCKHOLM, WHITSUNTIDE, 1923.

To the small party of British laryngologists who travelled to Stockholm at the invitation of the President and Members of the Section of Laryngology and Otology of the Swedish Medical Society, the journey through Holland and Denmark, and the few days spent in Sweden, will long remain as a very agreeable and happy memory.

In the early hours of an unusually cold and grey Sunday morning in May, the English steamer berthed quietly at the Hook, and discharged her complement of passengers to their several destinations. For us, the Hague had been selected as the first halting place with the object of enabling us to attend the Meeting of the Dutch Society for Nose, Ear, and Throat Diseases. In the short journey thither the eye recognises at once the scenery so characteristic of Holland. The canals, the true highroads of the country, upon which float the tall-masted, brown-sailed barges, the long lines of pollarded willows and the painted windmills, form the conspicuous features of a landscape rendered familiar by the brush of many artists. After a few minutes' stop at Delft, the birthplace of Grotius and Johannes Vermeer and the last resting place of Tromp, whose mythical broom had so often warned the English of his power to sweep their seas, our destination was reached.

## General Notes

A day and a half at the Hague, which was all that our itinerary permitted, would, in ordinary circumstances, have proved too short for a visit to a city with many historic associations and rich in its possession of some of the finest works of the Dutch school of painters. As the result, however, of the careful foresight and excellent arrangements made by our Dutch confrères, no moment of an arduous day was wasted. Under the guidance of Professor Burger and Dr Van Gangelen, the chief objects of interest were brought to our notice, and a drive to Scheveningen, whither all good Dutchmen go when they die, revealed to us the beauties of the Great Wood clothed in all its vernal splendour.

An hour in the Mauritshuis proved much too short for a thorough examination of its treasures. We would fain have lingered in further contemplation of Rembrandt's "School of Anatomy" and before Vermeer's beautifully executed "View of Delft," while an exquisite Madonna and child painted by Murillo deserved more than a passing glance.

It was unfortunate that our arrival on Sunday morning prevented our attendance at the Saturday Session of the Nederlandshe Keel-Neus-Oorheelkundige Vereeniging, at which Professor Quix and Drs Benjamins and de Kleijn had contributed papers. These Dutch otologists, in conjunction with Professors Magnus and Winkler, are continuing their important work upon the function of the static labyrinth, with the valuable results of which, readers of the Journal are kept cognisant through the careful abstracts contributed by Dr A. R. Tweedie. It was a matter of regret, too, that time did not permit us to visit Utrecht in order to see some of their experimental work, an omission, however, which can be readily rectified at some future period, as that town can be so easily reached. The X-ray treatment of tuberculosis of the larynx was dealt with by Dr H. Verploegh at the afternoon session on Sunday. The communication gave rise to considerable discussion, and some doubt was expressed as to the actual therapeutic value of the procedure. Professor Burger showed three cases of successful treatment of orbital and intracranial complications of accessory sinus suppuration, and Dr A. Boonacker communicated notes upon congenital fistulæ in the median line of the nose. In the evening, as guests of the Society, we enjoyed the hospitality of our friends.

The journey from the Hague to Amsterdam was made by automobile, Dr Hartog having generously placed both his car and his own services, as chauffeur, at our disposal. The drive, interrupted for a brief period to enable us to traverse the lakes in Professor Kan's motor boat, permitted us to obtain an excellent idea not only of the method by which the Dutch had reclaimed their land from the sea, but the manner in which the reclamation was preserved, along with the great agricultural advantages which had been derived from so doing. The glories of the tulip fields, unfortunately, had departed. Of Leyden, with her ancient University, within whose walls the fame of Boerhaave had once attracted so many of Britain's sons, we had to be content with a passing glimpse of buildings and spires. A dinner engagement in the evening at the hospitable and charming home of Professor and Madame Burger in the Keizersgracht, forbade any undue lingering by the way.

In Amsterdam, the commercial hub of Holland, "the city of old canals and old pictures," the traveller, if time permits of nothing else, must make

## General Notes

at least a short visit to the Rijks Museum. To the uninitiated, to the mere tyro in the street, who neither takes his ideas from Ruskin nor professes a technical knowledge of the art and craft of painting, "The Endless Prayer" of Nicholas Maes, the pupil of Rembrandt, made a stronger appeal than the more brilliant "Night Watch" of his famous master. This may or may not be heresy, but, after all, the pleasure which is derived from the contemplation of a picture is largely a matter of individual temperament.

A journey of twenty-four hours brought us and our Dutch fellow-travellers to Copenhagen, where we were warmly welcomed and hospitably entertained by Professor Holger Mygind and his son, Dr S. H. Mygind, and by Dr Jörgen Möller and his wife. In addition to a drive through the principal parts of the city, arrangements had been made for a visit to the Finsen Institute. Under the guidance of Dr O. Strandberg, the Director, an excellent opportunity was given to us of seeing the actual work in progress.

In the treatment of tuberculous disease, two methods are employed; the concentrated electric light rays are used for the irradiation of small surface lesions, or upon sectors of larger affected areas, while the non-concentrated method is made use of for the radiation of the whole body, in the form of the Finsen bath. We could not fail to be impressed with the busy scene disclosed, as we passed from one department of the large building to another and observed the different methods of treatment as they were carried out. Our interest turned naturally towards those patients who were suffering from lupus of the upper air passages and tuberculosis of the larynx, because the Institute, since its enlargement, has been able to undertake the treatment of laryngeal tuberculosis. We learned that while the Finsen bath was employed in the treatment of this affection, it was found more satisfactory to combine with it absolute voice rest, and such local surgical measures as the galvano-cautery in suitable cases. In this way the best results were obtained. Although the bath acted favourably upon the larynx, there is no proof that it has a similar action upon the associated pulmonary affection.

Dr Strandberg's most recent statistics dealing with lupus of the upper air passages, concern patients treated during the first nine months of 1921, and though the period of observation is short, the following results have been noted. During that period, 34 had been exposed to the Finsen bath; of this number, 3 had interrupted treatment, at which time 1 showed no improvement, while in the other 2, the condition was ameliorated; 5 remained under treatment, 3 of them being considerably improved. Of the remainder, 90 per cent. were apparently cured, though 8 of them have not come under observation since they were discharged. Of the others, the longest period without signs of recurrence was twelve months, too brief in a disease with the vagaries of lupus, to be altogether conclusive. The duration of the disease prior to treatment varied from one to sixteen years. Of the cases treated in 1919, when a longer period of observation had been possible—two years and more in some of them—the percentage of cures was 96. Apparently it is difficult to determine when to stop the treatment; undoubtedly, it should be continued for a time after all the local manifestations have disappeared, and the patient should come frequently under observation so that the slightest trace of recurrence

## General Notes

may be dealt with. This applies to all cases of lupus in whatsoever way it is treated, and it is to Finsen that we are indebted for this valuable advice.

To the Briton, especially to the dweller North of the Tweed, Sweden is a country which should make a strong appeal, as, in the past, the enterprising Scot has played an important part in its history and commercial development. Even to-day, many of the inhabitants claim a strain of Scottish ancestry. Stockholm, her capital, a city of handsome buildings and open spaces, with its many waterways intersecting the land and adding to the beauty of the scenic effect, fascinates the stranger, while her people impress him with a sense of their efficiency and well-being.

A good programme had been prepared for us, so that during the five days of our visit we were able to see not only what was of scientific interest, but much that pertained to the life of the city. A visit to Professor Gunnar Holmgren's Ear and Throat Clinic at the Sabbatsberg Hospital, and an inspection of the Radium Institute, gave us an opportunity of judging of the excellent work that was being done in both these departments of surgery. The Radium Institute, through which we were personally conducted by Professor Forssell, the Director, is an admirable example of a well-organised Department. The case records, illustrated by numerous photographs, are models of what such records should be, and the thorough manner in which the after-history of the patients, who have been under treatment, is followed up, enhances their scientific value. All the cases are recommended, their condition having been previously diagnosed. The most suitable line of treatment for each is carefully considered by Professor Forssell and then carried out by his staff of trained assistants. The Institute is provided with X-rays, radium and diathermy installations, so that a combination of two or more methods of treatment may be employed as the occasion demands. In the forty beds which the building contains, a great variety of cases is met with. Much of the work that is done is of necessity merely palliative, and we were shown several patients with inoperable scirrhus of the breast, whose condition had been greatly ameliorated by removal of the fungating tumour with the diathermy knife. An exhibition of a large series of photographs and drawings afforded us an opportunity of studying some remarkable end-results effected by radium treatment.

The Whitsuntide Session of the Section of Otology and Laryngology, to which we had been invited along with our confrères from Holland, Denmark, Norway and Finland, was held in the rooms of the Swedish Medical Society, a well-arranged building containing a large hall, a library and committee rooms. The guests received a cordial welcome from Professor Holmgren, who occupied the Chair, and who addressed his audience fluently in the English tongue. As a mark of courtesy to the British who were present, and one which they thoroughly appreciated, English was adopted as the official language, and it was a revelation to us, not unmixed with a sense of our own linguistic shortcomings, when we found that not only were our own papers communicated in English, but also those contributed by the representatives of the other nationalities who took part in the scientific programme.

After the Meeting an enjoyable evening was spent at Hasselbacken,

## General Notes

where we were entertained to dinner as the guests of the Section. A feature of the entertainment was the excellent speech-making and the recital in English blank verse by Hans Key-Åberg, a descendant of the Clan Mackay, of an ode, in which he eulogised the work of Harvey, Sydenham, Jenner and Lister.

Sunday was spent at Upsala, where we were the guests at luncheon of Professor and Mrs Bárány and of Dr Martha Henning. The journey was made by motor cars, kindly placed at the disposal of the Section by members of the profession and others, and an opportunity was thus furnished us of seeing the character of the country, which in several respects was reminiscent of Canada.

A few hours at Gothenburg which, unfortunately, only admitted of a cursory inspection of its great Exhibition, completed a trip which, from first to last, was full of interest and enjoyment.

We had found a people genuinely pleased to see us amongst them and courteous to the stranger within their gates; speaking and understanding our language with facility and generously hospitable, without ostentation. Such are some of the impressions left upon the mind after an all too brief visit; and associated with these reflections, there is left the desire that we should like to meet them again, when they, in their turn, will give us, on this side of the North Sea, an opportunity of returning, in some small way, the hospitality so recently bestowed on us.

A. L. T.

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### SECTION OF LARYNGOLOGY—ROYAL SOCIETY OF MEDICINE.

#### SUMMER MEETING, MANCHESTER, 15th and 16th June.

The successful Meeting of the Section fully justified the acceptance by the Council of Sir William Milligan's kind invitation to visit Manchester. Mr Lindley Sewell and the local Committee deserve the sincere thanks and congratulations of those members of the Section who were present.

It was evident from the full and varied programme that considerable care and thought had been exercised upon the preliminary arrangements, and that the Committee had been imbued with the desire to make the Meeting a success both from the scientific and from the social side. In this they had received the cordial support of the Board of Management of the Royal Infirmary and the practical assistance of some of their colleagues upon the staff. In addition to the routine work which characterises the Summer Meeting, Demonstrations were given in the X-ray Department by Drs Barclay, Morison, and Twining, and in the Radium Institute by Dr Burrows, while operations were performed by members of the Staff of the Ear and Throat Department.

Through the courtesy of the House Committee, the Annual Dinner of the Section was held at the Clarendon Club. The toast of the Section was proposed by Sir Henry Miers, the Vice-Chancellor of the University, and was responded to by the President, Mr C. A. Parker. The visit to Manchester leaves upon the mind a vivid impression of the activities of the Staff and of the wealth of material passing through their hands, and a very pleasant memory of their gracious hospitality.

# The Journal of Laryngology and Otology

*(Founded in 1887 by MORELL MACKENZIE and NORRIS WOLFENDEN)*

## PHYSICAL MEASUREMENTS OF MINIMUM AUDIBILITY.

By JOHN P. MINTON, Ph.D., National Research Fellow in Physics,  
Chicago, and J. GORDON WILSON, M.A., M.B., C.M., North-  
Western University Medical School, Chicago.

DURING the last three years we have made a large number of observations on the sensitivity of ears for tones of various pitches. In this investigation one of us made tests to determine in physical terms the minimum audibility, the other examined the subjects so tested to ascertain how far their ears and hearing could be regarded as normal, or varying from normal, from the standpoint of otology. Finally, a correlation of the data so obtained was made.

The present article is one of a series which the writers have published conjointly or separately on this subject, and it is concerned with the minimum stimulus required to awaken recognition of a pure tone at various frequencies—the threshold of hearing—chiefly in cases considered normal by otological examination.

It has long been recognised by physicists that the estimation of the minimum audibility of tones (the threshold of hearing) at all pitches is of prime importance to an understanding of the physics of audition. Within recent years, the physicists engaged on the development of the telephone service have devoted much time to the study of acoustics, for an adequate telephone service has necessitated a knowledge of the sensitiveness of the hearing of the average telephone user and a study of the threshold of tone perception. From their work

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otology is likely to benefit by more adequate apparatus to aid those markedly deficient in hearing; personally we are indebted to them for the apparatus we have used in the observations here and elsewhere described.

Reliable physical measurements of audibility have long been desired in otology, but only within recent years have instruments been available which promise to be practicable. In otology the testing of the absolute sensitivity of the ear at various pitches is of importance for diagnosis: (1) To determine the degree of impairment of hearing; (2) to localise in the tone scale where the impairment occurs; (3) to estimate the results of treatment. In each of these, the method to be here described has proved superior to the ordinary procedures, and, in some cases, it has pointed out defects not ascertainable by present tests. For the neurologist the data obtained from the acoustic mechanism of the ear are relatively insignificant when compared with data obtained from vision. The latter are not only more accurate in detail but of wider applicability. It must, however, be noted that the difficulties encountered in testing hearing are greater than in testing sight. In the ordinary testing of sight we can use one standard, white light. In testing hearing we have no uniform sound to use as a standard. While it is true that both light and sound are vibrations, the eye is not able and is not called on to resolve light into its composite colours, and, even if it were, the range of such vibrations is small compared with the ear. In the ear such differentiation of vibrations is an inherent part of its function as an organ of sense. One can scarcely expect the acoustic mechanism to rival in clinical value the widespread vestibular mechanism, but at least it is capable of more accurate determinations, and the plotting of "fields of audition" is not impossible.

For an accurate knowledge of the degree of hearing a patient possesses, we have to estimate the range of hearing (quality of hearing) and the quantitative degree at each pitch. It is well known that hearing for one part of the tone scale may be seriously impaired while that of another part is hardly affected. Accurate results can therefore only be obtained by estimating quantitatively the hearing at all pitches. As the qualitative degree may be estimated at from 20 cycles to 20,000 cycles or higher, one recognises the wide area to be covered.



# Physical Measurements of Audibility

The tests to estimate the amount of hearing present, fall into two groups:—

- (1) Speech-words or numbers, spoken or whispered.
- (2) Mechanical instruments which produce sounds—tuning-forks, acumeters, etc.

Since the most important function of audition is the hearing of the human voice, testing by speech is of great importance. But, as a test, its limitations are considerable. To mention but two out of many, it does not cover the whole range of audition, and defects in the upper and lower frequency scales, important in otology for diagnosis, are not covered by the voice range. Again, the lack of control over the vocal stimulus renders it useless to afford a common unit for measurement and a means to compare results obtained.

Instruments have been made which can produce tones over the whole frequency range of audition, but physical measurements based on them have been difficult to obtain. Of these, the best are the tuning-forks which can be made and used so as to ensure that one is dealing with a definite pitch. Overtones in the lower forks can be got rid of by clamps, and in the higher forks they are so much higher that they do not interfere with the application of the test. But it has been found difficult to measure with any degree of accuracy the amplitude of their vibrations or their energy stimulations of the ear, and vibration periods vary in each set of forks and may to some extent alter with their use. In comparing two ears a percentage estimate of hearing between the normal and defective ear has not been practicable. The difficulty of obtaining suitable apparatus, capable of examining the threshold of hearing over the range of hearing, has now to some extent been removed and audiometers of various types are in use in a few clinics—in Iowa, by Seashore and Dean, and in New York by Fowler and Wegel, and in Chicago by us.

To Dr C. E. Seashore, Professor of Psychology in Iowa University, otology is greatly indebted for many publications, over a number of years, which stimulated the interest in the acoustics of hearing among psychologists and physicists as well as among otologists. To his zeal and to the mechanical skill of his colleague, Dr Bunch, we are indebted for the pitch range audiometer. This instrument, which may be compared to a well-constructed electric siren, conveys the tones to the ear over a telephone. It has been used by Dr Dean and

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Dr Bunch in the otological department of Iowa Medical School for several years with much success.

The instrument used by us is the audion-oscillator, an instrument capable of producing tones throughout the audible scale, which tones can be reduced in amplitude below the threshold of hearing. The audion-oscillator has been described elsewhere. It is sufficient here to say that it consists of a vacuum tube circuit connected with an induction coil and condenser to determine the rate at which the electrons oscillate, and a sufficiency of amplifiers. Its applicability depends on the fact that electric currents of varying frequencies thus generated, force the diaphragm of a telephone receiver to give corresponding vibrations (tones communicated to the ear), and the energy required to make the diaphragm vibrate can be calculated from the current flowing through the receiver and from its electrical and mechanical characteristics (Minton, *Physical Review*, February 1922). The intensity of the sound transmitted to the ear is proportional to the energy.

In this investigation many factors had to be considered as possible sources of error—personal (psychological) in the subject examined and physical in the apparatus or surrounding media (*e.g.*, extraneous noises). In this paper only the most important sources of error are referred to. The question of a possible error in bone conduction has been discussed elsewhere (Minton and Wilson, *Proceedings of the Institute of Medicine of Chicago*, 1921, pp. 157-171). The personal factor is obviously of great importance, for in approaching the threshold we have difficulty in the determination of the area within which minimum audibility lies. To get rid as far as possible of this error, we took a series of four observations—two for disappearance and two for reappearance of the notes—and the resulting mean was fixed as the threshold. To obtain this threshold value, it is obvious that electrical resistances must be introduced which are capable of reducing the various pitches beneath minimum audibility. In addition, physical factors vitiating the results were sought for and eliminated as far as possible. Extraneous noises in the surrounding media, which tend to confuse the observer, were eliminated as far as possible by conducting the tests in a specially built sound-proof booth. There was no friction in the audion oscillator to be considered, but there were possibilities of error in the receiver.

The resonance in the telephone receiver as a source of

# Physical Measurements of Audibility

error was considered carefully. To eliminate this source in the present investigation, special receivers were made whose resonance frequencies were above the range tested, one of 5620 d.v. and another of 5890 d.v. Group I. includes tests with the former and Group II. with the latter receiver. It will be noted that there is little difference in the final mean curve. These results, together with results from other receivers, lead us to believe that in these tests this very possible source of error has been in the main eliminated.

Another question considered was the natural resonance of the external auditory meatus. The resonance period did not appear to affect our curves, for (1) in the same individual varying the amount of pressure of the telephone receiver on the ear did not affect the localisation of the resonance peaks found in this individual's minimum audibility curve; (2) the placing in the ear of a rubber plug a half-inch long with a small hole bored through it did not affect the locality of the peaks; (3) in the ears tested, there is no fixed frequency where the peaks occurred.

**Experimental Data.**—Three groups of curves are given in the present paper, showing the curves for the right and left ears of a number of persons (*see* Tables, pp. 410-413). The small circles indicate the right and the crosses the left ears. The ordinates, which are the reciprocal of the vibrational energies in ergs of the diaphragm of the receiver tuned to a natural period of 5620 d.v. (double vibrations) in Group I. and 5890 d.v. in Group II., are plotted on the logarithmic scale. The abscissæ are the frequencies in double vibrations per second. The ages of the persons are shown in the figures.

Group I. consists of 12 figures. On each figure the average of the twenty-four curves is shown by the solid line and is given for the purpose of comparison. The otological findings of the subjects whose curves are given in Figs. 1 to 12 may be summarised as follows:—There was no complaint of any ear or hearing trouble, no history of pain, tinnitus, otorrhœa or vertigo. The examination showed normal external canals, normal drum membranes, and no disease in the nose or pharynx. The whisper test was normal. The Rinne, the Weber, and the bone conduction tests were normal. The perception and duration of the forks, 64 d.v., 512 d.v., and 1024 d.v., and of the Galton whistle were normal. The only exception to the above statement was Fig. 10, in whom the

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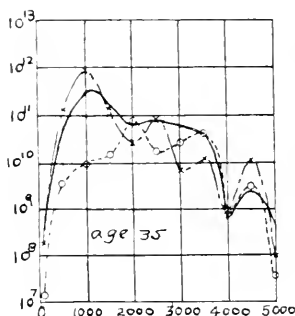


FIG. 1.

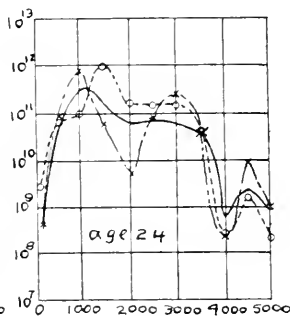


FIG. 2.

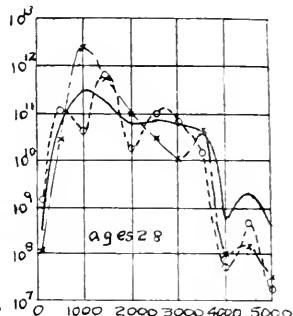


FIG. 3.

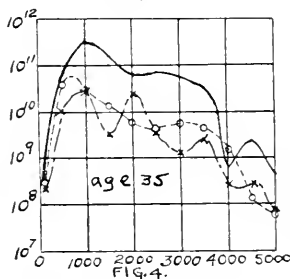


FIG. 4.

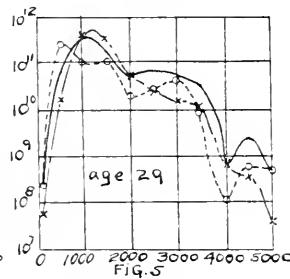


FIG. 5.

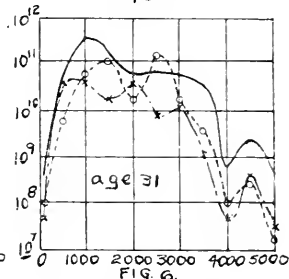


FIG. 6.

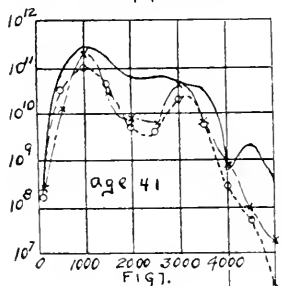


FIG. 7.

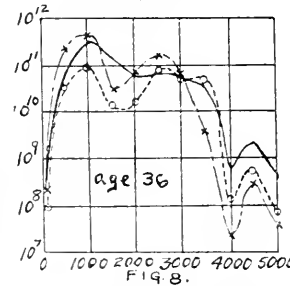


FIG. 8.

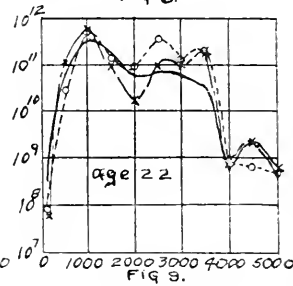


FIG. 9.

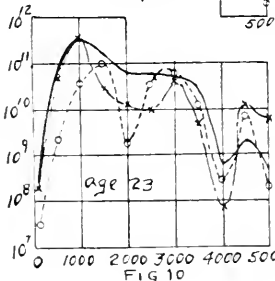


FIG. 10.

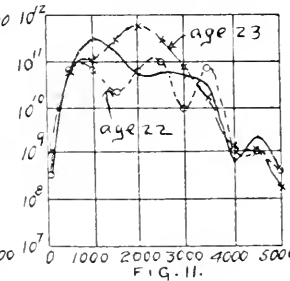


FIG. 11.

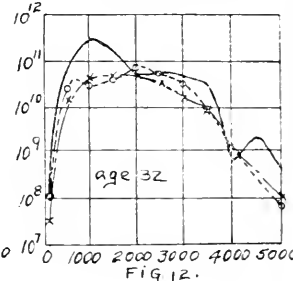


FIG. 12.

## GROUP I.

MINIMUM AUDIBILITY CURVES FOR NORMAL EARS.—Abscissæ=Double Vibrations per Sec.  
Ordinates=Reciprocal of the Vibrational Energy in Ergs of the Receiver Diaphragm  
Plotted on the Logarithmic Scale. Circles=Right Ears; Crosses=Left Ears; Solid  
Line=Average of all Tests.

## Physical Measurements of Audibility

right ear showed a marked break in the light reflex and gave the Weber test to the right.

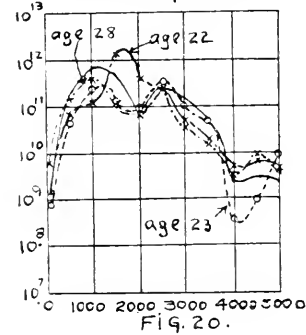
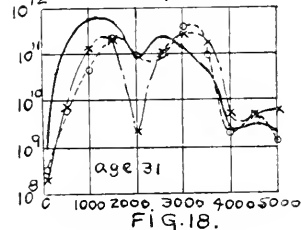
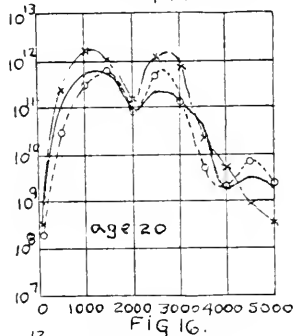
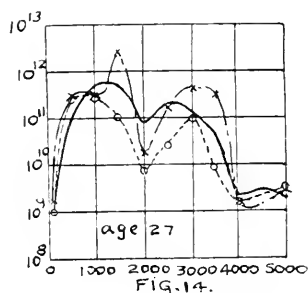
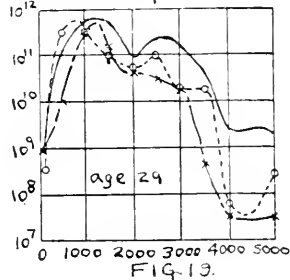
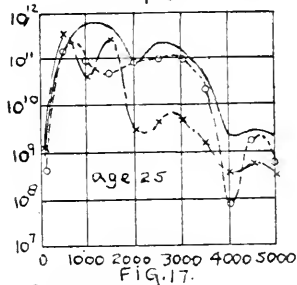
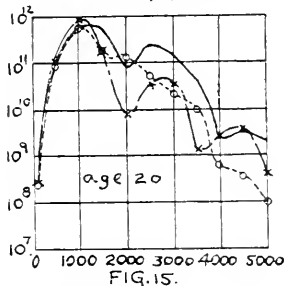
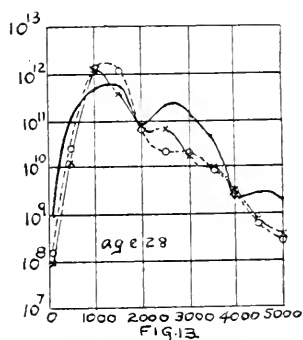
Group II.—For the purpose of checking the first group of tests another high natural period telephone receiver was constructed and tuned to a natural period of 5820 d.v. The curves shown in Group II. were taken with this receiver, and the average of these curves is also shown by the solid line just as in Group I. The circles and crosses are for the right and left ears respectively.

The otological findings in these cases, as in the previous series, were normal. The following cases showed exception: In Fig. 17 the tonsils were enlarged and the crypts were full of debris. The left drum membrane showed the light reflex broken so that it appeared as a very broad base with nothing at the umbo. The whisper test was diminished. The right ear was normal, except whisper test slightly less than normal. In Fig. 19 the drum membranes showed no light reflex, and the Galton whistle was diminished, but the other otological tests were normal. In Fig. 20 the right ear showed a patch of calcification in the anterior inferior quadrant near the periphery; the otological tests were normal.

In Group III. charts are shown from subjects who presented themselves as having normal hearing but in whom defects were found by both the otological examination and the physical testing. The correlation of these findings is discussed later (p. 415.) The average curve (the solid line) is also plotted in each figure of this group for the purpose of comparison. The curves in the first five figures of the group were taken with a receiver tuned to a natural period of 5620 d.v., and those in the last figure of the group were taken with a receiver tuned to a natural period of 5820 d.v. A comparison of the two average curves in, say, Figs. 25 and 26 will show how well the tests with the two receivers agree.

**Discussion of the Experimental Data.**—All of the curves are alike in that they show regions of maxima of sensitivity, but these regions are often different for the two ears of the same person, and they vary widely among the different subjects examined. The maxima of sensitiveness occur as low as 500 d.v. for some ears (*see* Figs. 17 and 23), and again, they are not reached until the frequency is as high as 2000 d.v. or over, as shown by the curves in Figs. 11, 12, 6, 18, 24, 21. When all the curves are considered, however, more of them have their

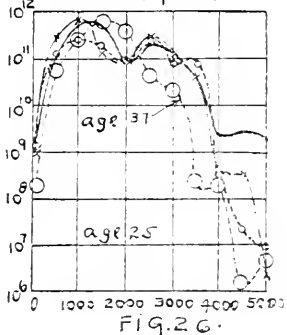
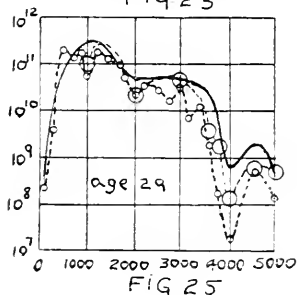
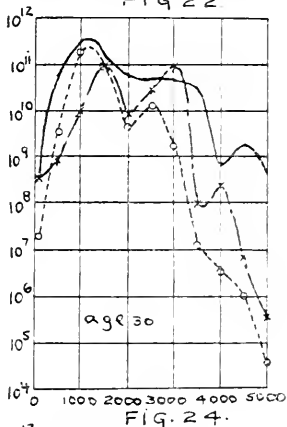
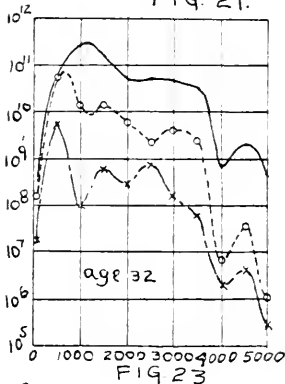
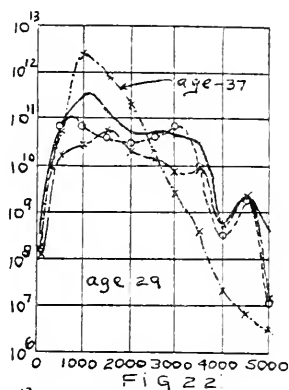
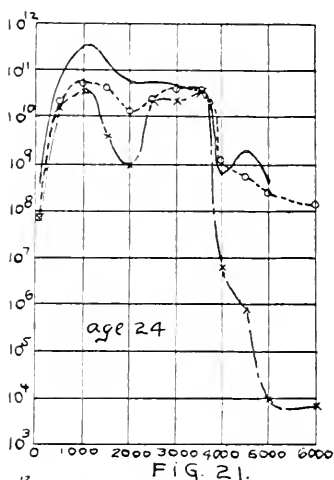
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## GROUP II.

MINIMUM AUDIBILITY CURVES FOR NORMAL EARS.—Abscissæ, Ordinates, Circles, Crosses and Solid Lines have the same Meaning attached to them as in Group I.

# Physical Measurements of Audibility



## GROUP III.

MINIMUM AUDIBILITY CURVES FOR SLIGHTLY DEFECTIVE EARS.—Abscissæ, Ordinates, Circles, Crosses and Solid Lines have the same Meaning attached to them as in Groups I. and II.

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maxima in the region of 1000 d.v. to 1500 d.v., and, for this reason, the average curves show the maximum in this region. Below 1000 d.v. the sensitivity decreases rapidly, but above 1500 d.v. there is little decrease until 3500 d.v. are reached. Above this upper limit the sensitiveness of the ear increases steadily. Roughly speaking, the ear is about equally sensitive for the tones of 100 d.v. and 5000 d.v.

It will be noted that the average curve is not one that is typical of an individual normal ear, for practically all normal ears have regions of distinct maxima, all of which are more or less eliminated and smoothed out when the average of a large number of ears is taken. For this reason individual curves should be studied rather than the average one, if correct deductions are to be made regarding the physical properties and functioning of a particular ear.

Though otological findings reveal little or no difference in the ears of a person with normal hearing, it will be noted that seldom are the two ears of the same person exactly alike in sensitiveness; they are more or less alike in magnitude unless something is wrong.

The curves show that, other things being equal, the sensitiveness of hearing of the younger subjects is superior to that of the older. Casual observation will show a marked difference between the ages of, say, 25 and 35.

A comparison of the average curves for Groups I. and II. shows that the two receivers (one tuned to 5620 d.v. and the other tuned to 5820 d.v.) gave practically the same kind of an average curve in both magnitude and shape. Some difference would be expected to exist, inasmuch as a different group of people were examined with the two receivers.

The correlation of the medical observations with the curves of sensitivity is of importance. The examinations were made at different times and the correlation done subsequent to both examinations. In no case do the findings obtained by the otologist and the physicist disagree. Thus, in Fig. 10 (Group I.), the right ear is lower in sensitivity than the left one below 3300 d.v., and the conditions observed by the otologist are in harmony with this physical observation.

In Fig. 17 (Group II.) the curve of hearing for the left ear is considerably lower than that of the right above 1800 d.v., and it is also much lower than the average for a person 25 years old. The otological findings agree with these observa-



## Physical Measurements of Audibility

tions in that the light reflex from the drum was broken so that it appeared as a very broad base with nothing at the umbo, and the whisper test was diminished. As above stated, it was noted that the tonsils were enlarged and the crypts full of debris.

In Fig. 19 (Group II.) the curves are low above 3000 d.v. and 3500 d.v., but it is doubtful whether this finding is associated with the absence of the light reflexes found in otological examination.

In Fig. 20 (Group II.) the right ear (circles) showed a patch of calcification in the anterior inferior quadrant of the drum membrane near the periphery, but the location and magnitude of this patch were such as to produce no marked depression on the degree of hearing.

The curves in Group III. are more interesting than those in Groups I. and II. from the viewpoint of correlation between the otological and physical findings. In Fig. 21 the curve for the right ear is a normal one, but that for the left ear is below normal at 2000 d.v. and very much below, above 3800 d.v. The otological examination showed little abnormality in either ear except that the left ear showed diminished air conduction so that both air and bone conduction were equal. The Schwabach test did not appear to be affected. In the left ear the C<sup>5</sup> fork was diminished and the high notes of the Galton whistle were not heard. From the history of this subject it was learned that he had had slight attacks of loss of balance with vertigo on rapid movement of the head. It is of some interest that he had several infected teeth. The agreement between the two examinations is most satisfactory, and together indicate a left internal ear or nerve involvement.

In Fig. 22 are given three curves, one for the left ear of a person 37 years old (right ear seen in Fig. 26), the other two are for the right and left ears of a person 29 years old. At the time of the tests, the latter person had a very bad cold in the head, and a week previous to the examination had slight pain in the right ear, but none in the left. The right drum membrane was normal except a punctate hæmorrhage at the umbo. The left drum membrane had a light reflex present only at the base. The Weber test was to the left. Whisper, tuning-forks, Galton whistle and Rinne were normal. The curves showed normal hearing, and the conditions observed by the otologist were of such a nature as not to affect the degree of hearing, or at least only slightly. With regard to

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the curve for the left ear of the person 37 years old, it is seen that the sensitivity is unusually large from 500 d.v. to 2500 d.v., but it is seriously depressed above 2500 d.v. The medical findings are interesting. In July 1921, the subject had an acute rhinitis accompanied by acute otitis media in the left ear with vertigo. For three weeks subsequent to the attack he had a pronounced diplacusis. From notes taken at this time he tells us: "The left ear perceived notes as being of different pitch from the right. Certain notes throughout the entire musical scale seemed to sound more markedly different than others in the two ears. I was not able to determine that the intensity of the note had anything to do with the effect. The left ear seemed to perceive some notes as being of double pitch, one of the true pitch and the other slightly lower. Many notes heard by the left ear were without this characteristic, and to this ear were as pure in quality as in the good (right) ear but lower in pitch." The left ear showed calcareous deposit in the membrane anterior to the malleus. The whisper was greatly diminished. The Rinne test was positive; the Weber was not referred; the high notes, the perception of C<sup>5</sup> fork and of the Galton whistle, were diminished. The history and otological findings, together with the depression for all the high notes shown in the curve, suggest an internal ear involvement.

Fig. 23 is from a subject whose drum membranes have a very diffused light reflex. There was no history of ear trouble. The tonsils were considerably enlarged. The drum membranes had a very diffuse light reflex, especially the left, which appeared thinner than normal. The whisper was below normal and perception of the C<sup>5</sup> fork and of the Galton whistle was diminished. These otological findings agree with the curves, which are much below the average, particularly the one for the left ear.

The person whose curves are shown in Fig. 24 had retracted drums, frequent attacks of pharyngitis, muco-pus in the nose, and a diminished whisper test at the time of the examination. The patient's hearing in the two ears was depressed at all the frequencies, particularly at the higher ones; Rinne was positive, bone conduction was not increased, and Galton diminished.

The curves in Fig. 25 are given to show the results in hearing acuity that occurred when three infected teeth were removed. The curve passing through the large circles was

# Physical Measurements of Audibility

taken a few weeks after the removal of the teeth. The change was marked for all the higher frequencies but not at all for the lower.

Three curves are shown in Fig. 26. The large circles are for the right ear of the person whose left ear was shown in Fig. 22. The other two curves are for the ears of a person 25 years of age who had recurring attacks of pain in both ears without otorrhœa, and both of whose drum membranes were retracted and thickened. The pharynx was markedly congested; the whisper test was diminished; Rinne was positive; the Weber not referred; hearing for C<sup>5</sup> was diminished; the Galton whistle was heard below normal. His curves show a marked depression above 4000 d.v. in both ears. The curve passing through the large circles is much depressed above 2500 d.v., and normal below that pitch, and is identical with the curve for the left ear shown in Fig. 22. In both ears the patient had otorrhœa at the age of 19 and 21. The right ear has a slight depression marking a healed perforation in the posterior superior quadrant and a calcareous deposit anterior to the umbo.

In the 54 cases cited in the present paper, there is not a single case in which the physical and otological findings do not agree as to whether an ear is normal or not. In addition, these curves show with physical precision the degree of hearing at all pitches. Here we have a method of mapping out by exact physical measurements a curve of audibility which is an invaluable aid to the otologist. From a limited experience of intracranial cases we are led to believe that neurology is likely also to benefit from the exact and graphic data given of the early involvement of the intracranial auditory pathway. The present practical limitations of this method are obvious—the expense of the apparatus, the nature of the calculations, etc. These are likely to be diminished with time. At present we must regard this method as giving valuable experimental data on which to build a further advance in otological knowledge.

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## ACUSTICUS TUMOURS.\*

By F. M. R. WALSH, M.D., F.R.C.P.

THE appearance within the past five years of two important contributions to the subject of acusticus tumours (I refer to Harvey Cushing's book, and to Mr J. S. Fraser's paper, read before this Section) has left little to be said, and I have no original information to impart, but it may be of some use to lay stress on certain points in the clinical picture, and to make some observations on the functional examination of the labyrinths in the light of the work of Magnus and de Kleyn. To my mind this work has shown the inadequacy of what has hitherto been regarded as a complete investigation of labyrinthine functions, and has revealed in a remarkable manner, and for the first time, the complex character of labyrinthine activities.

In its most characteristic form the clinical course of a case of eighth nerve tumour is well known and easily recognisable. From the fact that the tumour arises on the nerve itself, and on that part of it which lies in the internal auditory meatus, it is not surprising that symptoms referable to the *eighth nerve* should usher in the malady. These symptoms are progressive deafness with or without tinnitus. It is usual to regard tinnitus as an irritative symptom, and, in respect of the cochlear division, we should expect stimulation of the nerve to produce some such symptom. It must be remembered, however, that, in general, neurological experience does not readily favour the idea of "irritation" as an explanation of a symptom which may persist continuously for years, and is associated with a very slowly progressive pathological process. Such symptoms are more commonly found with acute or rapidly progressive lesions, and tend to be intermittent and transient. In this connection we may note that tinnitus is not a constant symptom, and when it does occur it may be long delayed. While, therefore, I have no alternative explanation to provide, we should not assume as a matter of course that tinnitus indicates what is loosely called "irritation" of the auditory branch of the eighth nerve. Nor is it always easy to establish deafness as an initial symptom, for deafness, like unilateral blindness, may pass unnoticed by a patient until revealed by examination. With

\* Paper read at the Section of Otolaryngology, Royal Society of Medicine, 16th March 1923.

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regard to the vestibular division of the nerve, I think vertigo is the only symptom we can definitely attribute to this branch. Only now, in the light of Magnus and de Kleyn's work, are we in a position to differentiate between cerebellar and labyrinthine defect-symptoms with any degree of accuracy, and the evidence indicates that ataxy in movement, nystagmus, and muscular atonia or hypotonia are cerebellar in origin and not labyrinthine. Magnus and de Kleyn have found that throughout the whole animal scale, from guinea-pig to ape, nystagmus is merely an immediate and very transient result of unilateral labyrinth extirpation. The sole permanent symptom is rotation of the head—so that the face points away from the side of the lesion—with some inclination of the head towards the affected side. In man this amounts to turning of the chin away from the lesion, and a lowering of the occiput towards the side of the lesion. This is a relatively common manifestation in cerebellar lesions, and is spoken of as a cerebellar symptom. When we recall the fact that the study of cases of tumour and gunshot wounds provides us with the bulk of our clinical material, it is apparent that in both instances involvement of the labyrinth or of the eighth nerve is to be anticipated, and therefore it seems probable that the so-called cerebellar position of the head is a sign of unilateral labyrinthine defect. Loss of muscle tone does not appear to be a direct result of labyrinthine extirpation, but when present it is due to the rotation of the head, which sets up what Magnus has called a "tonic neck reflex." This reflex, in turn, produces diminution of tone in the extensor muscles of the limbs on the side of the lesion. I would therefore say that deafness, tinnitus, vertigo, and inclination of the head are the symptoms definitely indicative of progressive paralysis of the two divisions of the eighth nerve. It may happen that these four symptoms long antedate the appearance of other focal symptoms, and when this is the case we may rightly speak of an initial or "otological stage" of the disease. So far, despite the exhaustive nature of the tests employed for the functional assessment of the eighth nerve, I have not met with a case of eighth nerve tumour recognised as such during this stage. I do not level this as a reproach at otologists or neurologists, for I believe that it would be very difficult to persuade the surgeon to act upon even the fullest information obtainable at this stage.

The next group of symptoms to appear, when the malady

## Acusticus Tumours

follows its usual course, are those referable to progressive paralysis of function in *cranial nerves adjacent to the eighth nerves*, and in the cerebellum. The first of the cranial nerves to show signs of involvement is usually the *fifth*. Here the symptoms may be grouped as irritative and paralytic. Among the symptoms actual pain is not common; the patients complain rather of abnormalities of sensation, such as numbness, creeping sensations in the skin, and so on. In one case under my observation, the patient first sought advice for a distressing feeling of numbness over the right cheek, and, among other diagnoses, that of an infected antrum was made. This may seem a trivial symptom to attract much attention, but anyone who has endured the application of cocaine by a dentist will know how obtrusive and annoying a small patch of anæsthesia on the face may be, and indeed this patient was found to have sensory loss and absent corneal reflex on the right side, physical signs which, had they been looked for, would have betrayed the nervous origin of the symptoms. It is commonly said that diminution or absence of the corneal reflex is the initial defect-symptom in progressive fifth-nerve lesions, and, in the case of which the specimens are shown, this was the only objective sign referable to the sensory division of the fifth nerve within a fortnight of death. Cushing records a similar case. The motor division of the fifth nerve is less commonly affected, though in the case just mentioned I was satisfied that there was slight but appreciable weakness of the masseter on the side of the corneal areflexia.

Next in importance, when it is present, is involvement of the *facial nerve*. Facial paresis may be a long-delayed sign, and is rarely profound. Generally it consists in slight asymmetry of the lower part of the face on voluntary and expressional movements. Like sixth nerve palsies, which we shall consider next, it is apt to vary from day to day, as was strikingly shown in one case which came under my observation. The patient was a woman with right-sided eighth and fifth nerve lesions and slight right-sided cerebellar symptoms. It was not possible to say definitely whether there was or was not a slight paresis of the right side of the face. However, a diagnosis of acusticus tumour having been made, the question of operative treatment had to be set before the patient, who was extremely upset and wept copiously for the rest of the afternoon. I saw her again just after tea-time, and was

surprised to observe a profound weakness of all the facial muscles on the right side. By the next morning this weakness had again disappeared. Undoubtedly, the violent muscular activity entailed in her crying had brought out, by a process of fatigue, a latent weakness of the face. Occasionally, irritative symptoms referable to the seventh nerve may be present in the form of clonic spasms of the face muscles, and Cushing records that a diagnosis of Jacksonian fits has been erroneously made and exploration of the crossed motor cortex undertaken to reveal the cause. The mistake may seem an absurd one, but it is by no means so. The twitching of the facial muscles may be so regular in force and rhythm as closely to resemble a Jacksonian fit. In a fatal case of lethargic encephalitis, which came under my observation some time ago, such a clonic spasm of the lower part of the face on the right side was the sole focal nervous symptom present throughout the course of the malady, and it was quite impossible to decide whether its point of origin was the cerebral cortex or the seventh nerve nucleus. Microscopic examination revealed an intact motor cortex, but showed that the seventh-nerve nucleus was the seat of characteristic and well-marked lesions. It must also be borne in mind that signs of a crossed hemiplegia may be present in eighth-nerve tumours, appearing first as slight paresis of the face of upper neurone type; I shall later describe such a case. It is scarcely surprising, therefore, that twitching of the face should be mistaken for a symptom of cortical origin value in cases where the typical picture of eighth-nerve tumour is not present.

*Sixth-nerve Palsy.*—Paralysis of the external rectus is relatively common, but, as it occurs in cases of the kind under discussion, it is almost certainly what Collier has called "a false localising sign." In other words, sixth-nerve palsy here, as in so many other varieties of cerebral tumour, is not the result of direct involvement of the nerve by the tumour, but is a general pressure effect due, according to Cushing, to strangulation of the nerve between the floor of the skull and the anterior inferior cerebellar artery. Its relatively late appearance, and its tendency to fluctuation and transient disappearance, both indicate this mode of origin.

Symptoms referable to the *ninth, tenth and eleventh nerves* certainly occur, but must be regarded as terminal symptoms, rather than as aids to diagnosis. They are manifested as



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dysphagia and dysarthria, and need not be further considered here.

Next in order of importance are symptoms dependent upon *compression of the anterior part of the lateral lobe of the cerebellum*. These vary in date of onset and in intensity from case to case, but they may be said to be a constant part of the typical clinical picture which we are now considering. They are referred to the side on which the tumour is situated and consist of muscular hypotonia, an inability to perform rapidly alternating movements, a tendency to spread of innervation to muscles not normally taking part in a particular movement and a tendency to error of projection, so that the patient overshoots the mark and may deviate above or below, to right or to left of the object aimed at. In the case of the lower limbs, this ataxy produces a staggering gait and an inability to co-ordinate the component elements in wide movements employing the musculature as a whole, so that the patient loses balance and tends to fall towards the side of the lesion. In the case of the muscles of the head and neck, the same disorder of co-ordination is manifested as nystagmus and defects in articulation. I do not propose to describe cerebellar ataxy in greater detail, or to recite the list of polysyllabic names of Greek derivation by which we have learned to replace a simple descriptive account. I cannot see that such words as "dysdiadochokinesis" have any informative value. On the contrary, they are apt to lead us to suppose that we have really got to the bottom of the nervous disorders which lead to the phenomenon in question, whereas we have not.

In short, the true focal symptoms of an eighth nerve tumour are referable to the eighth, fifth, and seventh nerves and to the cerebellum, and these generally usher in the clinical picture and dominate it throughout its course, and are the basis of clinical diagnosis.

We must, however, consider further the general signs of raised intracranial tension, not only because they form a part of the whole clinical picture, but because, as we shall see, they may dominate it so greatly as to obscure the focal symptoms. In this way they may give rise to a clinical picture widely different from that which we have been considering. In cases of eighth-nerve tumours, general pressure symptoms result from compression and distortion of the brain-stem, which block the exit of cerebro-spinal fluid from the ventricular

system and thus lead to secondary internal hydrocephalus. The symptoms produced in this manner are headache, vomiting and progressive impairment of vision from choked discs. In addition, there may be marked impairment of intelligence, leading to the not unknown error of diagnosing a frontal lobe lesion in cases of cerebellar tumour. As a rule, the true focal symptoms have developed before the effects of general increase of intracranial tension have reached any high degree, but, from time to time, general pressure symptoms dominate the clinical picture from the beginning, and the focal symptoms may never appear to their full extent. Gordon has recently recorded a series of cases of cerebellar tumour, including three of eighth-nerve tumour (so far as can be gathered from his report) in which focal symptoms were conspicuously absent throughout the whole course of the illness, and the impression obtained is that the apparent uniformity of the clinical course of an eighth-nerve tumour, as described by Cushing and others, depends in part on the fact that cases of this lesion are not recognised as such, unless this typical clinical picture is presented. In other words, a somewhat false and deceptive precision in our notions on the subject is apt to develop.

The case from which the specimens exhibited this evening were obtained was of such a nature, and a brief summary of the patient's history of the symptomatology may serve as a corrective to the simple cut-and-dried symptom-complex we have described. The patient was a young woman who was admitted to hospital for a uterine lesion. On admission she made no complaint of symptoms referable to the nervous system, but it was observed that she had considerable headache, appeared to have defective visual acuity, and was occasionally sick. In addition, she was apathetic and distinctly stupid. Examination revealed a chronic otitis media with free discharge in the left ear, which was completely deaf. There was bilateral papilloedema and gross impairment of visual acuity. Repeated examination from day to day revealed two other physical signs, the significance of which I freely admit I had not the courage to face, though their possible meaning did occur to me. These were: absence of the left corneal reflex and slight paresis of the left masseter muscle. The facial movements were normal on the two sides at first, and there was no defect of cutaneous sensation on the left half of the face. Arm movements, articulation, and deglutition were normal. She was not

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taken out of bed to test her gait. During the week following admission, there developed a distinct and constant paresis of the lower part of the right side of the face. On the appearance of this sign a left supra-tentorial decompression was performed, but it gave no relief to the rapidly increasing general pressure signs, and she died comatose.

At autopsy the tumour which is now before us was found. In situation, relations, and appearance, and on microscopic examination, it is clearly a typical eighth-nerve tumour. In addition, there is seen to be some dilatation of the ventricles and secondary internal hydrocephalus.

In this case, the presence of middle-ear disease on the left side blinded us as to the significance of the deafness, while the absence of sensory changes in the face induced me to hesitate to place much reliance on the loss of the left corneal reflex, or on the slight paresis of the left masseter. It is now clear that both were true localising symptoms. Nevertheless, the clinical picture is very different from that described as typical of this lesion and was dominated throughout by the signs of hydrocephalus. The pons is seen to be grossly distorted, and this no doubt was the source of the hemiplegic type of facial paresis observed on the side opposite to the tumour. The distortion of the brain-stem present in this specimen indicates also the high degree of compression that the ascending and descending paths may undergo without giving rise to disturbances of function, and, in general, we may say that variations in the reflexes, in power and in sensation in the trunk and limbs, develop late if they develop at all, and give no reliable information as to the side of the lesion.

There is one other point to be mentioned. I do not propose to describe the characters of the deafness found in these cases. Many of you have had a wide experience of eighth-nerve tumours and can state whatever generalisation may be possible in the matter far better than I can, but the vestibular division of the nerve raises some questions of physiological interest which may be worth brief mention. We may consider the eighth nerve as composed of sensory and non-sensory parts, namely, the cochlear and vestibular divisions. The vestibular nerve belongs to the non-sensory afferent proprioceptive system, and, as the work of Magnus and de Kleyn has revealed, is itself physiologically dual. It has two end-organs, subserving

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separable and distinct functions; these we may speak of as the otolith organs and the semicircular canals. These receptors react to stimuli of different quality and give rise to reflex reactions in the musculature of totally distinct character. The otoliths are stimulated not by movement, but by variations in the position of the head in relation to the horizontal plane. The reflex reactions they evoke are variations in muscle tone, and therefore in attitude, and these variations persist as long as the posture of the head which gives rise to them is maintained. Thus a tonic reflex arising in the otolith organ may persist for months, as Magnus has shown. The semicircular canals, on the other hand, are stimulated by rotation or by movement in a straight line, either vertically or horizontally. The muscular reactions resulting are not postures, but movements which cease when the stimulus evoking them fails. Mr Alexander Tweedie has described these different types of reflex reaction before the Section, and I shall not recapitulate his description. The point I wish to make, and I shall discreetly leave the subject having made it, is that what we commonly accept as a complete examination of the vestibular division of the eighth nerve is merely an examination of the semicircular canals and cannot be considered as throwing any light on the otolith organs, the functions of which are not less important. In other words, the work of Magnus has revealed that the labyrinth is a dual organ physiologically, and that hitherto we have investigated but one aspect of its functions. It seems possible that a careful investigation of the tonic labyrinthine reflexes might in these cases provide signs of distorted function in the labyrinth at a time when the present repertoire of semicircular canal tests gives us negative results. The elaboration of such an examination technique is in itself a piece of work which would be well worth doing, if for no other purpose than that it would make otologists familiar with the series of delightfully lucid papers, in which Magnus and his collaborators record observations, which have rendered obsolete much of the lore which still passes muster amongst us as the physiology of the vestibular nerve and the labyrinth.

## THE MORBID ANATOMY AND DRAINAGE OF OTITIC MENINGITIS.\*

By EDWARD D. D. DAVIS, F.R.C.S. (London).

MY observations are limited to otitic meningitis of the base of the skull and were made on thirteen autopsies, of which there are full notes, and on a number of specimens seen in the museums of the London Medical Schools.

**Pathological Observations.**—Otitic meningitis of the middle fossa and cortex of the brain was much more infrequent than that of the posterior fossa and was usually secondary to a temporo-sphenoidal abscess or to a localised meningitis. In the autopsies mentioned above, thick gelatinous pus was invariably found in the cisterna interpeduncularis, from which it extended in the subarachnoid space taking the path of the large cerebral vessels. In front, the pus spread over the optic chiasma and along the anterior cerebral artery to the longitudinal fissure to form a collection of pus above the corpus callosum. In the later stages, the pus travelled, on each side, along the middle cerebral arteries and Sylvian fissures to creep up the cerebral cortex. More frequently, suppuration extended backwards by the posterior cerebral arteries and around the crura to form an abscess between the tentorium and the superior surface of the cerebellum. The cisterna magna or cisterna cerebello-medullaris was free from pus in some cases, but when suppuration was advanced and in its late stages, pus extended backwards to surround the medulla and reach the cisterna magna by that route.

Collections of pus were present at—

- (1) The internal auditory meatus and on the posterior surface of the petrous bone immediately in front of the lateral sinus.
- (2) In the cisterna interpeduncularis.
- (3) Between the tentorium and the superior surface of the cerebellum.
- (4) In the longitudinal fissure above the corpus callosum.

The path of infection in seven cases was traced through the fenestra ovalis to the labyrinth and to the internal auditory

\* A Paper read at the Section of Otology, Royal Society of Medicine, 20th April 1923.

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meatus, thence to the under surface of the pons and the cisterna interpeduncularis.

In one case, there was thrombosis of the lateral sinus with a collection of pus around the sinus and covering the under surface and posterior aspect of the cerebellar hemisphere. In one other case, a collection of pus was found in the aqueduct of the vestibule and appeared to reach that position along the saccus endolymphaticus. Fistulæ of the external semicircular canal or of the promontory were not discovered. In the remaining four cases, the path of infection was untraceable and may have been part of a blood infection or septicæmia.

**Experimental Observations.**—In order to demonstrate the paths of infection, a series of experiments were carried out on the cadaver; the subarachnoid space was injected with a solution of methylene blue introduced through a funnel and tube placed in the internal ear and internal auditory meatus. At a subsequent examination when the skull cap and brain were removed, the methylene blue was in every case found in the cisterna interpeduncularis extending forwards to the optic chiasma and backwards around the crura to the interval between the tentorium and the cerebellum; no methylene blue was present in the cisterna magna or in the ventricles. Similarly, when the injection was made through the dura mater immediately in front of the lateral sinus so as to resemble infection by sinus phlebitis, the pigment was limited to the under surface and posterior aspect of the cerebellum, extending to the incisura posterior and to the cisterna magna; none was seen in the other cisternæ.

These experiments were made use of in order to test the various routes of drainage; thus, 30 c.c. of methylene blue were injected through the internal auditory meatus to the cisterna interpeduncularis, and practically all the 30 c.c. of pigment were recovered by aspiration through the same channel with a coarse needle and syringe. When a trocar and cannula were inserted through the atlanto-occipital ligament and foramen magnum to tap the cisterna magna, no pigment drained away.

Again, when 30 c.c. of methylene blue were injected in front of the lateral sinus, only 2 c.c. were recovered by aspiration, but occipito-atlantal puncture of the cisterna magna produced drops of the blue fluid.

Lastly, during and after the injection of methylene blue through the internal auditory meatus, a cannula was inserted

# Anatomy and Drainage of Otitic Meningitis

in the spinal theca in the lumbar region, and it was surprising to notice that no methylene blue came through the cannula, not even when 10 c.c. of cerebro-spinal fluid were drawn off and considerable suction employed by a syringe. Later examination of the brain showed no appreciable diffusion of the pigment beyond the cisterna interpeduncularis. These facts point to two conclusions; firstly, that repeated lumbar puncture during life does not increase the area of suppuration and, secondly, that lumbar puncture is inefficient as a method of drainage.

Although these experiments are artificial, and it cannot be claimed that they reproduce quite exactly the phenomena of meningitis during life, yet, in conjunction with the morbid anatomy, the following conclusions may be justified:—

1. When meningitis is so advanced that the cisterna interpeduncularis contains pus, or in the still later stage when there is pus in the cisterna magna, efficient drainage is obviously difficult. Therefore the prospect of saving cases of meningitis is very much improved by the earliest possible diagnosis, when the suppuration is limited to the labyrinth or lateral sinus area, or, even at the latest, when the suppuration is localised to the area around the internal auditory meatus and posterior surface of the petrous bone. An infection secondary to sinus phlebitis gives the impression that prognosis is better than when it occurs through the internal ear, because the suppuration is more localised to the posterior fossa and may not extend to the cisterna interpeduncularis.

2. When meningitis arises through the labyrinth, drainage and suction by a syringe through the internal auditory meatus is the most efficient and most likely to be successful.

3. If meningitis arises from sinus phlebitis, drainage and suction should be established both behind and in front of the lateral sinus, and in this type of case occipito-atlantal puncture may be useful.

4. Lumbar puncture is not a satisfactory method of draining pus, though it is recognised as a valuable aid to treatment. Weed, Wegeforth, Ayr, and Felton of the Rockefeller Institute have conclusively shown by a series of experiments and controls, that if a bacteraemia or septicaemia is produced in animals by the intravenous inoculation of the *Bacillus lactis aerogenes* or other organisms, a fatal meningitis is established by lumbar puncture or by the withdrawal of cerebro-spinal fluid. Meningitis, on the other hand, did not occur in those

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septicæmic animals in which cerebro-spinal fluid was not withdrawn.

The importance of these experiments is accentuated by the fact that meningitis is sometimes a blood infection, and the above observers have proved that animals dying of meningitis seldom fail to show organisms in the blood vessels either microscopically or culturally. Blood infection is almost invariably present if meningitis has existed for eighteen hours, and septicæmia probably plays an important part in the death of the animal with meningitis. Further experiments strongly indicated that involvement of the meninges from the blood stream was facilitated, after removal of cerebro-spinal fluid, by the reduction of the pressure of the fluid or other general intra-cranial reaction, even if such reduction was of very short duration; it was not related to the injury produced by the needle. The immediate replacement of the cerebro-spinal fluid by Ringer's solution does not prevent the onset of meningitis, and it is thought that fluid leaks into the tissues through the puncture; the leakage could be diminished by using a fine needle, and, incidentally, prevent "lumbar puncture headaches."

This excellent work from the Rockefeller Institute supports Jenkins' statement that only the smallest quantity of cerebro-spinal fluid, sufficient for diagnosis, should be withdrawn by lumbar puncture.

REFERENCE.—*Monographs of the Rockefeller Institute for Medical Research*, No. 12, 25th March 1920, "A Study of Experimental Meningitis," by Weed, Wegeforth, Ayr, and Felton.



# CRITICAL REVIEW

## PERORAL ENDOSCOPY

### CARDIOSPASM, PREVENTRICULOSIS, OR PREVENTRICULAR STENOSIS?

By CHEVALIER JACKSON, M.D., Sc.D.

To anyone following the literature of cesophageal disease since the advent of cesophagoscopy, it is becoming increasingly apparent that the term "cardiospasm" is obsolescent if not obsolete. Prior to cesophagoscopic studies with their materialistic contributions of direct inspection everything seemed very satisfactory. Deductive diagnosis, antispasmodic treatment, and a few autopsies, at rare intervals, showing post-mortem patulency, seemed to leave little room for question. Then came the observations of A. Brown Kelly,<sup>1</sup> MacAllister,<sup>1</sup> Wilhelmina Able,<sup>1</sup> Hill, Rouget, Liébault,<sup>2</sup> the reviewer and others, showing that the stenosis in the syndrome known as cardiospasm was not located at the cardia. Guisez, M'Kinney, Liébault, Jackson, and others noted the presence of cicatrices which seemed logically to be the sequelæ of spasmodic stenosis, but which nevertheless constituted an organic stenosis. Rolleston, quoted by Tilley,<sup>3</sup> believed in a cardiac sphincter, and suggested that "paralysis or continued inhibition of the longitudinal muscular fibres of the cesophagus would allow dilatation of the tube to occur, and at the same time, by interfering with the opening of the cardiac sphincter, would induce hypertrophy of the muscular coat."

Solis-Cohen has demonstrated to the reviewer cases of "cardiospasm" due to what Solis-Cohen has aptly termed "autonomic endocrine ataxia." Recently M'Nab has called attention to endocrine imbalance as a factor in so-called cardiospasm, and Pancoast has drawn attention to the frequency with which the initial symptoms develop early in the second decade of life. The latter observation raises the interesting etiological question of adolescence, either with or without an endocrine phase. These observations will probably find abundant corroboration by anyone who will review his cases.

One author<sup>4</sup> finds no true spasm in "cardiospasm," but rather a cramp or failure to open what he calls the "diaphragmatic pinch-cock." We read: "The pinchcock action of the pericesophageal diaphragmatic structures, especially the sphincter-like prolongations of the crura demonstrated by the author to coexist with a kinking of the abdominal œsophagus, undoubtedly accounts for the fact that a man may stand on his head after drinking a quart of water, or eating a full meal, without any of the stomach contents gravitating out of

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the stomach into the cesophagus, and, indeed, without the acrobat experiencing any subjective sensation of the mechanism by which the gastro-cesophageal communication is so tightly closed to retrograde leakage. More remarkable still is the fact that a man may, with a stomach nominally full of liquid food, assume a position with the mouth much below the level of the stomach, swallow liquids against gravity through an cesophagus steeply slanted upward, adding to the fluid in the stomachal reservoir without any of the stomachal contents escaping. The efficiency of this normal combined pinchcock and kinking closure against regurgitation is wonderful. In going down the cesophagus with the cesophagoscope the pinchcock action is so manifest, and so manifestly at the hiatus, as to admit of no dispute. This pinchcock action is evidently normal, and evidently, also, it is momentarily relaxed by the co-ordinate deglutitory mechanism with every normal swallowing act and with the somewhat less well co-ordinated act of emesis. It seems logical to attribute some cases of phren-cesophagospasm to disorder of this co-ordinated innervation, that prevents normal relaxation of the pinchcock at the proper moment in the deglutitory cycle. It seems logical to suppose that the dilated, strongly pulsating, thoracic aorta so frequently associated with phren-cesophagospasm might be due to a minor degree of pinching of the aorta by the crura of which the hiatal pinchcock is the prolongation. This is purely conjecture with only the frequent clinical association of the dilated aorta with the phren-cesophagospasm to support it. The kinking of the abdominal cesophagus between the stomach and the diaphragm is not so clearly demonstrable as the hiatal pinchcock, and requires the support of theoretical and of cadaveric experimental data to demonstrate its existence."

Mosher<sup>5</sup> has supplied cadaveric data partially to substantiate the fact that kinking exists; but he believes that the normal opening of the lower end of the cesophagus is due rather to the movement imparted to the liver by the diaphragm and the abdominal muscles during respiration, there being normally a momentary narrowing of the cesophagus at the superior edge of the liver when the diaphragm is up and the barium milk hesitates there a moment. When the diaphragm goes down and carries the liver with it, the cesophagus opens and the barium milk shoots into the stomach. This corresponds with the cadaver finding that when the liver is pulled downward the cesophagus tends to open. When the liver is up it exerts most pressure on the cesophagus. "In grouping my cases of cardiospasm I find that there is an element of stricture in the majority of them, and the stricture is by preference at the beginning of the liver tunnel, that is, at the upper edge of the liver. It has long seemed to me that it was asking too much of spasm to make it the sole cause of the extensive deformity which is present in long-standing cases of cardiospasm. To my mind

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it would be more rational to invoke some mechanical explanation either as the sole cause or at least as the continuing cause once the condition is initiated." In substantiation of his view as to the organic nature of so-called cardiospasm, Mosher cites ten clinical cases of stricture of the liver tunnel, four of which were in the form of a crescentic fold which he ruptured with the œsophagoscope. We read that "three of the cases had a full stricture with a central opening. The stricture was at the hiatus or rather at the upper edge of the liver. On divulsing the stricture with the mechanical dilator a crescentic moulding was seen in the right field below it. Steady pressure caused the tube to pass this and enter the subdiaphragmatic œsophagus and then continue on into the stomach. This mound I now believe to be the upper edge of the liver. I feel that the upper edge of the liver is probably glued to the œsophagus and reinforces these strictures." Below the strictures the subdiaphragmatic œsophagus was believed to be normal. In other cases Mosher found the whole liver tunnel narrowed. "The œsophagoscope demonstrated three partial strictures, one succeeding the other at a lower depth and all just above the liver. At the edge of the liver there was a small central opening through which the tube could not be made to pass. The reason for this is seen at once by looking at the X-ray plate. This shows a narrow and long liver tunnel. It seems—to sum up the findings—that we can have strictures at the upper or lower end of the liver tunnel or anywhere in its course, or we can have a narrowed liver tunnel or a stiffened tunnel through which the food runs slowly. In any of these cases as long as the œsophagus retains its peristaltic action there may be an element of spasm from time to time which reinforces the obstruction caused by the stricture or by the rigid or narrow liver tunnel. My observations would seem to show, however, that spasm is a minor element in these cases. The cause of the annular stricture at the upper edge of the liver tunnel or of the narrowing of the whole of the tunnel will be found, I believe, in some previous infection of the lesser omentum." In other cases the stricture was central and "the œsophagoscope would not pass into the stomach. In one of these cases of central stricture the patient gave a history of an attack of general peritonitis twenty years before. The origin of this was never discovered. On divulsing the central stricture an oblique band was seen running upward and to the right. The tube would not pass this. Below the band the normal subdiaphragmatic œsophagus was seen. One case was probably traumatic, the other inflammatory." A number of cases are cited illustrating the co-existence and probable causal relationship of pre-existent organic intra-abdominal disease in so-called cardiospasm. Lynah<sup>6</sup> and Iglauer<sup>7</sup> have each reported a case corroborating this observation.

Sargnon,<sup>8</sup> in a most excellent and concise review of the subject,

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refers to a congenital valvular condition as an organic basis in some cases. Guisez and Goudet are quoted in this connection.

All the authorities quoted, and many others, serve to show that there are not only many opinions as to etiology and pathology, but also that there are probably many different diseases eventually to be separated from each other, but now included under the misleading term cardiospasm.

If we grant, as it seems we must, that the syndrome called cardiospasm is not at the cardia, and is not often, if ever, spasmodic, it would seem that the time has arrived for the complete nosological elimination of the word "cardiospasm." Yet we all must feel that the syndrome is such a definite clinical entity that a substitute is necessary, or, at least, desirable. Such a substitute, obviously, must leave out all reference to etiology because of the embryonic and fluid state of our knowledge and opinions.

The reviewer begs to suggest as a substitute for "cardiospasm" the term "preventriculosis." Though open to unimportant etymologic objections, it seems preferable to the double term "preventricular stenosis." In either case the various diseases, be they few or many, would fall naturally into three groups, namely (1) organic, (2) spasmodic, and (3) combined organic and spasmodic. Either term would be more in line with the nomenclature in use by entomologists and ornithologists than the rather awkward term "pregastric stenosis," though the latter might serve. The reviewer's choice would be "preventriculosis."

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## SOCIETIES' PROCEEDINGS

### ROYAL SOCIETY OF MEDICINE—SECTION OF OTOLOGY

March 16, 1923.

*Chairman*—Sir CHARLES BALLANCE, K.C.M.G., M.S., *Vice-President*.

**Acusticus Tumours**—F. M. R. WALSHE, M.D.—(The Paper is published in the *Journal of Laryngology and Otology*, August 1923, p. 419).

**Surgical Treatment of Eighth-Nerve Tumours**—WILFRED TROTTER, M.S.—The auditory fibroma is a benign slow-growing tumour, which is almost invariably single. Its great seriousness as a pathological condition is therefore due entirely to its situation. Successful operation leads to a certain cure with very little subsequent disability. The problem as to how these tumours should be removed is thus one which justifies the minutest attention to its purely technical side.

It is important that the surgeon should have a clear idea of the anatomical conditions which (*a*) give rise to the characteristic symptoms of the tumour: (*b*) lead to certain important complications; and (*c*) restrict and condition the method by which the tumour is to be reached.

Of these considerations the most important are those which arise out of the situation of the tumour in front of the cerebellum and to the side of the brain-stem. This situation renders it necessary to approach the tumour after dislocating the cerebellar lobe, and gives rise by pressure on the central canal of the nervous system to the most important complication that is met with, viz., secondary hydrocephalus with a general rise of intracranial tension.

It is when this complication is present, as it almost invariably is in the late stages, that the operation becomes most difficult and dangerous. From the surgeon's point of view it is almost impossible to exaggerate the difference in seriousness of operations undertaken before or after the onset of secondary hydrocephalus.

The principal features of operative technique are as follows:—The patient is in the prone position with the head flexed and supported on a separate head rest. The intratracheal method is the most convenient for the anæsthetic.

The crossbow incision is used, and in dividing the muscles it must be remembered that the close suture of them at the conclusion of the operation is very important. The bone is removed so as to expose the

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lower edge of the lateral sinus on each side, and to open up the foramen magnum freely. Throughout the procedure it is extremely important to restrict the loss of blood in every possible way. To ensure this the free use of Horsley's wax is most important. The dura mater is opened in the foramen magnum over the cone of cerebellum, which usually has been displaced into the spinal canal. The freeing of this part of the cerebellum usually results in an escape of fluid, and a reduction of the local tension. If the tension is not reduced in this way, the lateral ventricle must be tapped through a separate opening in the bone above the superior curved line, by means of a needle passed into the posterior horn. When the dura has been freely opened and everything has been done to relieve the intracranial tension, the cerebellar lobe is drawn inwards until the tumour is reached.

It is important to remember that during this process cystic collections of fluid are apt to be met with, and may be mistakably regarded as the source of the symptoms. When the tumour itself is reached, it is to be recognised by its consistence being greater than that of the brain, by its smooth surface, and by its fixation to the outer wall of the posterior fossa.

No attempt is made to remove the tumour intact. The capsule is opened and its contents removed by curetting or by suction, if the latter is possible. In favourable cases, after the substance of the tumour has been got out, an attempt should be made to remove the capsule. This can in certain cases be safely accomplished, and, if it is not done, a recurrence of the disease is certain to take place sooner or later.

Throughout the intracranial stage of the operation hæmorrhage is often free, but it can usually be controlled by saline packing, and no time should be grudged for this purpose. The dura mater is left freely open, the muscles are very carefully sutured so as to prevent a leakage of cerebro-spinal fluid, and the skin wound is completely closed.

After such an operation, if the patient escapes immediate effects of shock and hæmorrhage, the only serious danger is the development of œdema of the medulla. If this does not occur within the first forty-eight hours the prospects of a satisfactory recovery are very good.

In general, it should be the object of the surgeon to complete the operation at one sitting. He will, however, be occasionally compelled to break off on account of technical difficulties in controlling hæmorrhage or reducing intracranial tension. Such a decision should not be founded on any expectation that a mere decompression operation will be of any permanent benefit to the patient, but should have in view another attempt at removal of the tumour when local conditions become more favourable in the course of a few weeks.

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## DISCUSSION.

Sir CHARLES BALLANCE (Chairman) said that he saw his first case of tumour of the auditory nerve as long ago as 1887. Sir Seymour Sharkey asked him to see a patient who had come in with absolute deafness in one ear, and double optic neuritis. The case was recorded in *Brain* in 1889. The patient was a male, aged 41, and there had been a gradual onset for about two years, with occasional pain in the head, and tinnitus. He was taken into hospital. The headache increased, he had continual giddiness and tinnitus, and ultimately attacks of unconsciousness. Six months after he (Sir Charles) saw him, the patient began to suffer from facial palsy, and three months later he died. The specimen was in St Thomas's Hospital Museum. Though Sir Seymour Sharkey held the view, shared by others, that it was a case of tumour of the auditory nerve, there was, at that date, no question of operation, and no physician would have listened to a suggestion to remove such a tumour. At the post-mortem examination, it was found that the tumour invaded the internal auditory meatus, which was expanded. Radiography, and the comparison of the meatus on the two sides, were great aids in present-day diagnosis. In Politzer's work appeared a picture of a tumour of the auditory nerve, about the second case the speaker knew of. It was that of a woman who had had deafness for ten years. When seen three months before death she had double optic neuritis, soon followed by facial paralysis and dementia. The specimen was obtained by Dr Von Millengen, of Constantinople, and sent by him to Politzer. The internal auditory meatus was expanded by the pressure of the tumour. In dissecting a tumour of this sort, it was a surprise to see how the facial nerve could gradually lengthen and wander over the side of the tumour, and how late in the case facial palsy might come on. It might be that the palsy supervened when pressure from the growth in the internal auditory meatus occurred. About two years after Sharkey's case he saw another case, that of a woman, and she also died. He saw the post-mortem examination done. The tumour was in much the same position, and facial palsy only supervened three months before the end. As Mr Trotter pointed out, these cases often died of internal hydrocephalus. He (Sir Charles Ballance) had long ago assisted at some of the first operations in London on encapsulated tumours of the posterior fossa. At first these tumours were avulsed much in the same way as weeds are taken from a garden path, but fortunately a more gentle and dainty method now prevailed, care being taken that no drop of blood should be lost. In one early case at St Thomas's Hospital, when he had exposed the tumour he felt he had reached the summit of his ambition, for he thought the growth would come away easily. He removed it, but there was severe hæmorrhage from the superior petrosal sinus. He had seen very serious hæmorrhage from the anterior inferior cerebellar artery, but that from the petrosal sinus was more serious, as it was difficult to control. There was a way to prevent hæmorrhage in exposing these tumours which had not been mentioned. It was a method used by Sir David Ferrier. He used marine sponges, perfectly dry. They absorbed the cerebro-spinal fluid and compressed the brain without injuring it, and it was a method he (Sir Charles Ballance) recommended to operators.

He agreed with Mr Trotter as to the uselessness of a decompression operation in these cases. Decompression seldom relieved serious local

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pressure. With regard to doing the operation in one stage, as Mr Trotter advocated, that, of course, was the ideal method, but he (Sir Charles) thought that in the two-stage operation there was this great advantage that, if one opened the dura mater—and no operation was effectual without opening it—the patient in some cases would stand the operation better. Before the war he knew of two cases in which the dura mater was not opened, and the patient died before a second operation could be done. Many years ago he did some experiments with Sir Charles Sherrington to see what would be the effect of taking away large portions of the skull, and how much more fluid could be introduced into the intradural space after such a large craniotomy. They found that the amount of fluid which could be introduced by removal of the bone alone was infinitesimal. Therefore, it was clear that there was no relief of pressure, however large the craniotomy was; the dura mater must be opened, or the patient was not safe.

With regard to the great discomfort of having even a small patch of anaesthesia, mentioned by Dr Walshe. In some of these cases there was involvement of the fifth nerve, and the fact of the discomfort he could corroborate from his experience of a case he saw after the South African war. A colonel had sustained a gunshot wound of the leg, which divided the external saphenous nerve. It rendered the outer side of his little toe and foot anaesthetic, and though previously a good walker, he could not then march more than 200 yards. Dr Walshe had mentioned a case of mistaken diagnosis, in which spasm of the facial nerve had led to the diagnosis of cerebellar tumour being changed to that of a tumour above the tentorium, as it was looked upon as a Jacksonian symptom. He (Sir Charles Ballance) had experienced that kind of mistake on more than one occasion. He remembered two such instances which had caused him much distress. Both patients were nurses. The first had symptoms of tumour of the brain, and much pain in the head. Dr Hughlings Jackson, Sir William Gowers, Sir David Ferrier and Dr Charles Beevor saw the patient on several occasions, and all concluded there was a tumour in the left cerebellar fossa. He (the speaker) removed all the bone over the cerebellum, and there was no tumour in either cerebellar fossa. Much fluid was let out. She became comparatively well for fifteen months, and then was ill again. She came into the hospital, and died eighteen months after the operation he had performed. An encapsulated tumour of the meninges of the opposite frontal lobe was found which could easily have been removed. She had had crossed cerebello-frontal headache. Three years ago a similar event happened, and he exposed the cerebellum without finding a tumour there. In the case of this nurse also, a most careful examination was made by several neurologists and she died about two years afterwards. There was an encapsulated tumour of the opposite frontal lobe, and if it had been diagnosed and operated on would have come out like a pea from its pod.

A patient was shown here by Mr Cleminson, from whom the late Sir Victor Horsley removed an auditory nerve tumour, and he observed that there was a dropping of the shoulder. He (Sir Charles Ballance) believed Dr Gordon Holmes, in his Lectures, ascribed this dropping of the shoulder to hypertonia due to involvement of the cerebellum. He (Sir Charles) did not remember, in any cases of tumour of the cerebello-pontine angle he had seen, that dropping of the shoulder was noted before the



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operation. Probably this was due to a failure in observation. Therefore the case shown by Mr Cleminson was of great interest to him.

Dr GORDON HOLMES said that experiences differed, and certain symptoms probably attracted the attention of some observers more than others ; but on the whole he agreed with the clinical picture which had been put forward by Dr Walshe and Mr Wilfred Trotter. He had seen a large number of cases of the kind under discussion, especially during the last few years, and previously he had had a rather extended experience of them as a pathologist. He had been impressed by the variability in the shape of the tumour ; in some cases it was a firm, more or less spherical mass, in others, a growth of softer structure which moulded itself along the lateral surface of pons and medulla. He thought this fact was the explanation of the considerable variability of symptoms seen in different cases ; in those in which a spherical tumour lay in the region of the internal auditory meatus, the upper cranial nerves alone were affected, but in many cases the early symptoms pointed to a disturbance of the lower cranial nerves, weakness of the palate, disturbance of the movements of the vocal cords, dysarthria and occasionally dysphagia occurring. He had that day looked through notes on thirteen cases which he had seen in the last year or two, in all of which the diagnosis had been confirmed either by autopsy or by operation ; he found that few had marked anæsthesia on any part of the face, only a small proportion complained of pain or numbness there, though in a large number, but not in all, the corneal reflex on the same side was absent. Therefore it could not be said that there was always clinical evidence of disturbance of the trigeminal nerve. In his experience the facial nerve was more frequently involved than it was described as being by Dr Walshe. The extraordinary feature of these cases, to those who had the opportunity of examining the brains after death, was the infrequency of hemiplegic or sensory symptoms on the opposite side of the body. When one saw the side of the pons deeply excavated, one was almost forced to the conclusion that the function of the pyramidal tract and perhaps of the lateral fillet, must have been seriously involved, yet the proportion of cases in which there was weakness, spasticity, changes in the reflex or any form of anæsthesia of the opposite side was very small. He had not seen any cases confirmed by autopsy which did not present sufficient symptoms during life to justify a definite diagnosis. In every case which had come under his observation there had been obvious symptoms of cerebellar disturbance. These symptoms differed in some respects from those due to lesions of the cerebellum itself, probably because they were mainly a result of compression of the middle cerebellar peduncle rather than of involvement of the cerebellum. A striking feature was that there was often in these cases very little disturbance of tone. It was perhaps presumptuous on his part to refer to the surgical treatment, but so many cases of his had passed through the hands of surgeons that he had had some experience in the matter. He had seen one case only recover after gross removal of the tumour, a man upon whom Sir Victor Horsley operated many years ago, but though he lived for several years he was seriously crippled. The danger seemed to be that total removal necessarily meant a disturbance of the vascular supply, on the same side, of the pons and medulla ; the man to whom he referred had after the operation the characteristic symptoms of softening in the

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lateral side of the pons. He saw a few other cases which had survived operation for a week or so after total removal of the tumour, and all showed evidence of acute bulbar involvement. The statement made by Mr Trotter and Sir Charles Ballance as to the inefficacy of simple decompression seemed to be borne out by everyone who had had experience of these cases. But here too there were exceptions. One of the most brilliant results he had seen in the matter of surgical intervention was in the case of a man he saw with Mr Percy Sargent three years ago. Owing to difficulties during the operation, the scalp was at once sewn up after the tumour had been exposed. The patient had now lost most of his symptoms, and though he was a professional man to whom co-ordination was important, he was going about and leading an active life. He particularly wished to know whether in the experience of otologists there was complete nerve deafness in all cases of auditory nerve tumour which had reached the clinical stage at which a diagnosis could be made.

Mr SYDNEY SCOTT said this subject interested him from the otological standpoint. He had himself seen forty-five cases in which a tumour involved the auditory nerve. He had sections of the labyrinth showing that the growth often invaded the cochlea, and if an attempt were made to remove the tumour in such cases it would have been necessary to remove the labyrinth to make sure of getting rid of the whole tumour.

Dr Gordon Holmes had suggested there was a period in which the diagnosis could be made before deafness was complete: but in investigating these cases he (Mr Scott) had never felt justified in diagnosing such a tumour until there was almost absolute deafness. The difficulty was to make sure of this, because the good ear was so liable to hear the loud tones used in testing the deaf ear. The use of the Bárány noise apparatus was limited: it excluded tones of low pitch, but it did not exclude high tones; in cases of intracranial tumour, when optic neuritis of high degree was present, there was practically always diminished bone conduction, and some loss for the highest tones. Great loss to low tones was much more consistent with the presence of auditory nerve tumours than was taught in many text-books on otology. Loss to low tones was more important as a sign of auditory nerve tumour than loss to high tones alone, of which latter there were many causes. As a rule, the typical signs were great and progressing loss of low tone appreciation, with diminished bone conduction, and some bilateral loss to high tones. Preservation of low tone appreciation was unusual, but he found this in a man who had a tumour originating not in the auditory nerve, but as a pre-pontine intradural cholesteatoma. The mass spread to one side pressing the pons and the auditory nerve backwards. The patient, an intelligent young man, appeared to be very deaf for conversation; he said he could hear the sound of the voice but could not analyse the sounds. Mr Scott ascertained that the patient could hear, on both sides, a fork of sixteen double vibrations per second, but tones above 440 vibrations were to him an utter blank on one side, while, on the other, he could hear to about 5000 vibrations per second. As the result of Magnus's investigations, Dr Walshe foresaw that our customary vestibular tests were incomplete. Still the caloric rotation and galvanic tests, together with the hearing tests, sometimes took three hours for a single patient; the testing could not be hurried or completed at one sitting, and great delibera-

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tion had to be exercised or the results were unreliable. Sir Charles Ballance had referred to the possible confusion of frontal and cerebellar lesions. This should be impossible. One patient, on whom it was proposed to operate for frontal tumour, on the left side, was next morning sent to Mr Scott to be tested owing to deafness in the right ear. He concluded there was a lesion of the right auditory nerve, because he found the vestibular tests were negative, as in cases of labyrinthine ablation, and there was complete absence of the galvanic test on the affected side. The physician was informed, and the diagnosis altered. A right extracerebellar tumour was found. Another patient with bilateral auditory nerve tumours bore a transcephalic galvanic current of 20 ma., without any sign of vertigo or forced movements of eyes, head, etc. A 10 or 15 ma. current in the ordinary person caused forced movements when applied to the normal ear. He had described elsewhere the method suitable for the galvanic test. One electrode was placed on the wrist of the side to be examined, the anode being placed on the ear on the same side, so that the current passed through the vestibular nerve on the side being examined. Whenever possible it was preferable that the patient be tested standing, as weaker currents were required. The galvanic reaction had been positive on the normal side, negative on the affected side in all cases in which the patient had been proved to have a lesion affecting the nerve trunk. There should no longer be any such mistake as diagnosing a frontal tumour for an extracerebellar tumour, or vice versa. Mr Scott owed his experience of auditory nerve tumours to his colleagues, Dr Gordon Holmes and the physicians at the National Hospital, who had referred so many of their cases to him for special examination. He had used the Bezold-Edelmann tone series and the Edelmann-Galton whistle or monochord for all hearing tests.

Sir JAMES DUNDAS-GRANT asked whether members had been able to confirm the diagnostic point described by Jones in his work on equilibrium and vertigo as an indication of auditory nerve tumour. Jones said that on the same side as the tumour all the caloric tests were negative, *i.e.*, for the vertical as well as for the horizontal canals, and that on the sound side the reflex from the horizontal canal was positive, but for the vertical canals negative. Sir James had shown before this Section a specimen from a case in which these signs had been quite distinct: a tumour was found distending the internal auditory meatus. The supposition was that the strands from the vertical canal ran upwards near the middle line for some distance further than those which crossed to the horizontal canal; therefore the tumour transmitted the pressure through the brain to the strands going to the vertical canals of the sound side; these were so close to the middle line as to be involved, while the strands to the horizontal canal escaped. Much of the testing could be carried out by means of the "cold air" apparatus with little disturbance of the patient; he could rest in bed with his head on a low pillow for the horizontal canals, and could sit up for the vertical canals. The galvanic tests were of enormous value, especially when those for the labyrinth were negative. In the case of an auditory nerve tumour, the galvanic test became negative as well as the caloric.

Dr WALSHÉ replied that he had expressed himself as of opinion that we were apt to have unduly precise notions as to the typical clinical picture of

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eighth-nerve tumours, and it was not surprising, therefore, that in the course of his exceptional experience Dr Holmes had observed cases not presenting the usual clinical picture. Nevertheless, he believed that the symptom-complex he had described was the most typical, though there was really no disagreement between Dr Holmes and himself on the general question.

April 20, 1923.

Chairman—Sir CHARLES A. BALLANCE, K.C.M.G., M.S.,  
Vice-President.

**The Morbid Anatomy and Drainage of Otitic Meningitis—**  
EDWARD D. D. DAVIS, F.R.C.S. (See *Journal of Laryngology and Otology*, August 1923, p. 427.)

## DISCUSSION.

Mr SOMERVILLE HASTINGS asked what Mr Davis considered to be the clinical indications for occipito-atlantal puncture. He himself had never done it, and he would be glad to hear what was its technique.

Mr J. F. O'MALLEY asked what symptoms would induce Mr Davis to open directly through the labyrinth, or, to put a drain through the wall of the antrum in front of the lateral sinus ; or did he think it an advantage to do both at the same time ?

Mr T. B. LAYTON said he was interested to hear that there was some danger in doing lumbar puncture. He used to imagine that it was a small operation which could not do any harm, and, therefore, in any case of doubt it should be carried out to help the diagnosis. Mr Davis's paper seemed to show that although it might be undertaken in order to obtain further evidence when necessary, there were cases in which the question should be carefully considered. He asked whether, in either of Mr Davis's cases which were successful, organisms were found in the cerebro-spinal fluid. Information was needed as to what was the kind of case in which drainage of the cerebro-spinal cavity was advisable, in the hope of saving the patient's life, as distinct from cases in which removal of the infected bone in relation with the dura mater was all that was necessary.

Sir CHARLES BALLANCE (Chairman) said this was an extremely important subject, as the treatment of these cases was a matter of life and death. Mr Layton had referred to lumbar puncture ; he (the Chairman) had known sudden death occur from lumbar puncture, which should never be done without careful consideration in certain cases, because it produced a change in the position of the cerebellum, and affected the vital centres in the medulla. Another important question mentioned by Mr Layton was as to whether organisms were present or not. Frequently, in past years, he (the Chairman) had done lumbar puncture and had found turbid fluid ; and he thought there was no question that organisms had been present, but the reports frequently stated that the milky condition of the fluid was

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due simply to the cells, since no organisms could be cultivated from it. If no organisms were in the fluid, and the proper treatment was carried out, the patient would, almost certainly, recover. But if organisms were present, the difficulty of saving the patient was likely to be very great indeed. In the fulminating cases of meningitis the patient might die within thirty hours of the onset. In such cases the outlook was at present hopeless, though the attempt to save life should not be abandoned. He had been interested in Mr Davis's remark about methylene-blue injections into the subarachnoid space. During the war, he (the Chairman) had found that washing out the subarachnoid space from the lateral ventricle in cases of meningitis, and putting the puncture-needle into the lumbar theca, the salt solution coloured with methylene blue came out of the lumbar puncture cannula in twenty-five seconds. It was therefore extraordinary to hear now that in a dead body the fluid obtained by lumbar puncture was not coloured by the methylene blue, which had been injected definitely into the subarachnoid space of the cranial cavity. There was no doubt, as Mr Davis had said, that the only possible treatment of these cases was by operation, and that the surgeon should be able to operate within a very short time of what he believed to be the onset of meningitis. That, however, was very difficult to ensure, because the usual experience was that patients in these cases were not seen until they were practically moribund. At first the symptoms were slight, but later, unconsciousness supervened, and the surgeon was called in in the hope of saving life when that had become impossible. The course of the cerebro-spinal fluid in health was well known, and in the living body the fluid carried coloured material rapidly in various directions. In Golla's experiments on the cat, injections into the lumbar theca spread rapidly almost everywhere. It was known, also, that the fluid was secreted by the choroid plexuses, and came out of the ventricles through the openings in the roof of the fourth ventricle, spreading into the great cisterna at the back of the under surface of the cerebellum, and then travelling forward into the interpeduncular space and various cisternæ at the base of the brain. It also flowed down the spinal canal. It then spread, as Mr Davis described, over the surface of the hemispheres in the direction of the superior longitudinal sinus, especially in the region of the Sylvian fissure. Probably some members had seen the spread of this rapidly fulminating subarachnoid meningitis; he had watched it on the operating table; the greenish pus underneath the subarachnoid membrane spreading from sulcus to sulcus between the convolutions. Everyone wanted to know how this process could be arrested. He (the Chairman) disagreed with Mr Davis on one point—namely, that occipito-atlantal puncture was a surgical operation which should replace drainage. To his (Sir Charles Ballance's) mind, such a view was reactionary, in the sense that none of them nowadays would think of treating an acute abscess in any other position by means of puncture with trochar and cannula. Occipito-atlantal puncture was easy to do, and there was no danger in it, unless the operator was in doubt of his ability to perform it. But he felt strongly, from what he had seen post-mortem in meningitis cases, that no puncture was capable of arresting the process which was spreading in the subarachnoid space. If the condition was due to infective organisms, he (Sir Charles) thought the only possible surgical way of

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dealing with it was by Haynes' method. If the stream of fluid could only be directed out through a surgical opening in the great cerebellar cistern, its spread in the other directions might possibly be arrested. He had always been much impressed with the fact that meningitis and other infections in the skull were greatly helped by increased pressure. If the pressure of the fluid in the subarachnoid space were reduced, he believed there would be a good chance of preventing the further spread of the infection. If, then, by opening the great cerebellar cistern, one could diminish the pressure of the fluid in the subarachnoid space, and start the current of fluid in a new direction, the hope of stopping the spread of inflammation over the brain surface might be entertained. But as matters stood at present one could not expect to cure all these cases. He thought, however, that the condition should be treated as an acute suppuration in any other part of the body was treated.

Mr E. D. D. DAVIS (in reply) said that the method adopted for occipito-atlantal puncture was as follows: The head must be slightly flexed and the needle entered at a point in the mid-line of the neck immediately above the spine of the axis and directed in the mid-line to the frontal-nasal suture. The needle would be felt to go through the occipito-atlantal ligament with a jerk; then it was necessary to move carefully and to see that the direction to the fronto-nasal suture was correct. The operation could be done without an anæsthetic. It was now frequently performed without mishap. He (Mr Davis) thought that occipito-atlantal puncture might be sometimes more useful than Haynes' operation. He considered that the cisterna magna contained pus only in the very late stages of meningitis, hence Haynes' operation was generally unsuccessful at so late a stage of meningitis. Occipito-atlantal puncture was valuable in cases in which the patients were more or less moribund, and in which the surgeon felt impelled to do something. In reply to Mr O'Malley's question as to when to drain through the labyrinth, Mr Davis said that if it was decided that the meningitis had arisen from labyrinthitis—that is, when the signs of labyrinthitis had preceded the meningitis—drainage should be established through the internal auditory meatus and the labyrinth. He admitted that it was sometimes difficult to decide upon labyrinthine drainage in suspected meningitis when the diagnosis was uncertain, as it required some courage to go through the labyrinth and destroy the internal ear. But if there were indications that meningitis had reached the skull through the labyrinth, then drainage through the internal auditory meatus must be done. When meningitis arose from lateral sinus thrombosis or infection, he (the speaker) left the labyrinth alone and drained in front and behind the lateral sinus. One of the two cases he had mentioned, was that of a patient whom he had shown at a former meeting of this Section. She had all the symptoms of meningitis—headache, vomiting, drowsiness, and the cerebro-spinal fluid gave pneumococcus on culture. He had operated practically as soon as he saw her. There was a large extradural abscess between the posterior surface of the petrous bone and the dura, arising from a perisinus abscess which tracked forward between the dura mater and the petrous bone; he had drained this and had left the wound open so that, later, if there was no improvement, he could drain through the dura mater. The patient had done well for

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a few days, but then she had become more drowsy and vomiting had recommenced. He (Mr Davis) therefore drained the subarachnoid space in front and behind the lateral sinus and the patient recovered. He thought it was a localised meningitis of the posterior fossa. In the other case, the patient had had an acute attack of suppuration sometime after a radical mastoid operation performed elsewhere. There had been a temperature of 103° F. and signs of meningitis, therefore the mastoid had been opened up again and the posterior fossa drained behind the lateral sinus. The cerebro-spinal fluid had contained pneumococci. The patient had done well.

The cases recorded by Mr Lawson Whale and Mr Martyn appeared to have been similar to these two cases.

**Case of Complete Deafness dating from a Fall**—Sir JAMES DUNDAS-GRANT, K.B.E., M.D.—Male, aged 48, became completely deaf about three and a half years ago, after a fall of 6 ft. on to his feet, not striking his head but suffering pain in his neck several days later. He felt ill and had to be helped home. During the night he had diarrhoea and vomiting and next morning was quite deaf. He was told that he shouted when speaking. The result of gross suggestion treatment was negative and in favour of an organic lesion. The anomalous character of the data has rendered the diagnosis difficult.

In May 1922, he appeared to be totally deaf for sounds of any kind, there being then no voice-raising with noise-machines in the ears; the click of the large "distinette" produced a palpebral reflex. Marked spontaneous nystagmus to the left and slight past-pointing to the right; the voice was monotonous. Lip-reading had not been spontaneously acquired. Rotation to the right, with external canals horizontal, produced no increase of nystagmus to the left. Rotation to the left produced active nystagmus to the right but no past-pointing. Cold air to the right external canal caused nystagmus in thirty-five seconds; to the left external canal no nystagmus after sixty seconds; to the right vertical canal caused slight rotary nystagmus to the left; to the left vertical no response. Past-pointing and giddiness were not induced by any of these tests. Galvanism (tested in November) on either side with 15 ma. excited nystagmus in the direction of the cathode.

These tests suggest a lesion—concussion—of both labyrinths, the auditory nerve trunk being unimpaired. The left labyrinth appeared to be more affected, yet the spontaneous nystagmus was to the left side. The symptoms varied slightly from time to time, so as to suggest a functional element in the case, as also did the diminution of the pharyngeal reflex.

**Case of Deafness greatly increased after a Fall**—Sir JAMES DUNDAS-GRANT, K.B.E., M.D.—Female, aged 29, had been dull of

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hearing for nine or ten years, but became extremely deaf ten months ago after a fall of 25 ft., in which her head was knocked, and, after which, she was unconscious for seven or eight days. When first seen in September 1922, whispered voice at 12 in. on the right side and 2 in. on the left, reduced by inflation to 6 in. and  $\frac{1}{2}$  in. respectively. Ordinary voice at 14 in. and 4 in.; after inflation 3 ft. and 2 ft. respectively. The hearing for Gradenigo's tuning-fork (64 d.v.) was reduced considerably, viz., to 3 and 2 instead of 6. Bonnier's test (tuning-fork 128 d.v. heard through condyles of femur) was positive. Paracusis Willisii was present. Bone-conduction on mastoid normal; Rinne markedly negative: Weber positive. Galton's whistle normal (1.1). Eustachian tubes were slightly narrow. The features were essentially those of otosclerosis: no family tendency; no initial tinnitus.

Occasional inflation and frequent self-inflation; small doses of *ignatia amara*, 5 minims of liq. hydrarg. perchlor., thrice daily. This last remedy was given because of Erichsen's use of it in the treatment of "railway spine" concussion, to which the traumatic condition in the present case seemed analogous. In October, she felt better and freer from tinnitus. Condition now stationary. She states she hears as well as she did before the accident.

The nature of the change induced by the accident is to some extent a matter of conjecture. It may have been either functional or organic. The history supplies sufficient ground for either or both.

**Case of Long-standing Deafness attributable to Falls on the Head; Improvement**—Sir JAMES DUNDAS-GRANT, K.B.E., M.D.—Male, aged 25, with deafness of 15 years' duration with a history of a fall when 10 years old, followed by giddiness and commencing deafness.

First seen October 1921. Whispered voice 5 in. right and 10 in. left. On inflation 12 in. right, no change in left. C 64 d.v. not heard. Tuning-fork by bone-conduction on vertex equal both sides and on mastoids slightly increased; Rinne negative. C 128 d.v. heard by femur condyle (Bonnier). Galton's whistle reduced to mark 4 on the right and 3.2 on the left. Eustachian tubes narrow. Gellé negative right, positive left. Rombergism to right, nystagmus to left. Cold air, nystagmus delayed; past-pointing normal.

The features are those of nerve-deafness, probably cochlear, with concomitant chronic Eustachian catarrh.

The patient is well-built (up till recently played football), cheerful in disposition, but with a somewhat monotonous voice. There is a slight asymmetry of the face. His deafness was so considerable that he was unable to use the telephone, and his livelihood was in



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jeopardy. He was also so unsteady and apprehensive that he had to be accompanied by his brother.

Inflation (catheter, Politzer, etc.), and in November reported improvement. Eustachian tubes appeared more pervious. Was ordered glycerophosphates and paraffin.

In January 1922, whisper, right 2 ft., improved by inflation to 5 ft.: left  $2\frac{1}{2}$  ft. improved to 7 ft. Galton (left) 4.6. Induction of nystagmus still delayed.

In view of the traumatic factor he was ordered tentatively small doses of liq. hydrarg. perchlor. In March, whisper, right 3 ft. improved to 5 ft.; left 5 ft. improved to 20 ft. In December, whisper right side 2 ft., improved to 4 ft.: left 18 ft., improved to  $18\frac{1}{2}$  ft. In February of this year, influenza with retrogression in hearing-power. The improvement in general alertness and usefulness is unmistakable in what at first appeared a most discouraging case.

He is to be examined by an ophthalmologist on account of defect of vision in his right eye; this may throw fresh light on his case.

Sir CHARLES BALLANCE (Chairman) said that no surgeon objected to perchloride of mercury being given to any patient, and in these particular instances the drug appeared to have been useful.

Mr F. J. CLEMINSON said he had recently seen a man aged 29 who, while crossing the Channel in a gale, was quietly sleeping in a saloon when a slab of marble, weighing 1 cwt., fell on to his head, causing not only profound traumatic neurasthenia, but considerable deafness in both ears, especially in the right. That had occurred twelve months ago, and the patient had had treatment for some time, and had eventually brought a suit against the railway company; it was in that connection that he (Mr Cleminson) had seen him. The condition he had found was a marked deafness to both the voice and acumeter on the right side, and to a less degree on the left. A 30-in. watch had been heard at 8 in. by the right ear, and at 16 in. by the left. When the ears were syringed with cold water, there had been a delayed response on the right, and the tests with the tuning-fork, etc., had pointed to internal ear deafness on that side. He (Mr Cleminson) was unable to visualise the lesion which occurred in such cases; perhaps Sir James Dundas-Grant could suggest what happened. He had only seen the patient twice, at an interval, and he did not know what had happened to him since the last occasion.

Mr J. F. O'MALLEY said these cases often presented difficult problems, *e.g.*, as to why a patient should be seized with sudden deafness, apart from injury. A fortnight ago, a woman engaged in selling newspapers in the street came to see him at the clinic, accompanied by a friend who stated that the patient had been well until four days previously, then deafness had suddenly occurred, and she had been unable to hear anything since. There was no history of an accident or of vertigo which would suggest a sudden lesion of the labyrinth, rupture of a blood-vessel, or an invasion of a syphilitic nature. He (Mr O'Malley) had had the patient's vestibular

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reaction tested, and there was a good response. In the case of a deaf and aphonic soldier whom he had seen during the war, when, after producing a vigorous vestibular reaction with a cold application, he had applied a speaking-tube, and shouted down it, he had obtained a prompt answer. But he had obtained no answer from the patient in the case to which he was now referring. Sir James Dundas-Grant's second case seemed to him (Mr O'Malley) to be one of otosclerosis; but it would be difficult to explain how the fall had increased the deafness, as the tests showed that bone conduction was good all the time. He thought there was a large element of functional disturbance in that case. In the third case he had noticed the peculiar voice—a manner of speaking associated with deafness in early childhood; the patient learning to speak better as he grew older. He (Mr O'Malley) had found that kind of voice in cases in which the patient had had an attack of cerebro-spinal meningitis in early life, but in which the hearing had not been completely obliterated, and later, difficulty had occurred in controlling the pitch of the voice.

Mr E. D. D. DAVIS said that during the war he had seen several cases of injury in the region of the mastoid process in which the deafness was permanent. In the commoner concussion case, such as that from a motor accident, the hearing really did improve. If the hearing did not improve in six weeks after the accident, he (Mr Davis) considered that the deafness was likely to be permanent. He asked whether one was justified in that conclusion. It was his experience that in deafness occurring after a shell or bullet wound in the region of the mastoid process or posterior fossa of the skull, without any direct injury to the ear itself, the loss of hearing was usually permanent.

Sir JAMES DUNDAS-GRANT (in-reply) said it was useful to remember the old observation that when the handle of a broom was struck on the ground, the handle was driven more deeply into the broom-head. A fall on the feet sometimes caused fracture of the base of the skull, and there might be real damage to the delicate structures in the internal ear even in the absence of skull fracture. He (Sir James Dundas-Grant) believed that these injuries were often accompanied by fractures which healed and left no trace, even on post-mortem examination years afterwards. He thought that in some cases of injury of the head, at some distance from the ear, there was a fracture through the internal ear, or at all events such a shaking up that the internal ear was rendered insensitive, and it might be completely disorganised by hæmorrhage either into the labyrinth or the internal auditory meatus. He agreed with Mr Davis that if no improvement took place within six weeks, there had been something more than a mere concussion and that destruction had occurred. But his experience in the third case showed that it was a pity to despair too soon.

## ABSTRACTS

### NOSE AND ACCESSORY SINUSES.

*On the Local Treatment of Lupus Vulgaris of the Nose and Larynx by Electrocoagulation.* AXEL VIBEDE. (*Acta Otolaryngologica*, Vol. v., fasc. 1.)

This paper contains the results of the treatment at the Finsen Light Institute, Copenhagen, of 193 cases of lupus of the nose and throat by means of diathermy, either alone, or combined with the Finsen bath. About 82 per cent. were apparently cured, while Reyn's electrolysis gave only 50 per cent. of apparent cures. Diathermy has the advantages over electrolysis in that the treatments are few in number (on an average two sittings for each patient) and of short duration, and large doses of iodine are avoided. Its disadvantages are the cost of the apparatus; the difficulty of limiting deep-seated action and the inefficiency of local anæsthesia. Deep-seated destruction can be best avoided by using as powerful a current as possible during the shortest time possible. Local anæsthesia is of no use since the nerves in the surrounding tissues are affected both electrically and thermally far beyond the area under treatment. When, however, the treatment is of short duration, most patients tolerate it quite well without general anæsthesia; otherwise a light general anæsthesia is quite sufficient. In two cases secondary hæmorrhage occurred at the end of a fortnight, but was easily arrested by pressure.

THOMAS GUTHRIE.

*Seasonal Hay Fever.* J. H. BLACK, M.D., and ANNETTE BLACK, Dallas, Texas. *Amer. Med. Assoc. Journ.*, vol. lxxix, No. 26, 23rd December 1922.

The treatment of hay fever in Texas is discussed. The majority of the series of 100 cases was of the autumnal variety and treated with ragweed pollen. The authors claim no complete cures but they obtained various degrees of improvement in all. The intradermal injection of the pollen is advised. In testing, they state that only twelve out of ninety cases had escaped intranasal operation, but in no case was the hay fever benefited.

P. G. GOLDSMITH.

*Radiographic Aspects of Nasal Accessory Sinus Suppuration.* W. UFFENORDE, Marburg. (*Archiv. für Ohren-, Nasen- und Kehlkopfkunde.* 110 Band, 2/3 Heft.)

In a lengthy contribution, illustrated by five diagrams, Uffenorde states that the presence or absence of air *per se* is almost a negligible factor in the interpretation of X-ray photographs of the nose and

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accessory sinuses. For example, the normal variation in the shadow of the ethmoidal labyrinth is a question not of air content, but of density and thickness of bone. He has found that neither occlusion of existing air-spaces with fatty tissue nor introduction of an inflated indiarubber ball under the forehead appreciably modifies the shadows. Experiments with hollow aluminium cubes lined with various materials, references to ventriculography, and other data lend further support to his thesis.

A suspicion that skiagrams often fail to reveal an early inflammation of an accessory sinus until its bony walls participate in the process has been strengthened in several instances by the subsequent appearance of "veiling." Conversely, positive findings in healed sinusitis are probably due to persistent sclerosis: even a chronic dacryocystitis has on the neighbouring bone an effect which is demonstrable by X-rays. Clinically, the doctrine that bone plays no part in a typical sinusitis is unimpeachable, but X-rays are concerned with physio-chemical rather than morphological conditions. Uffenorde is a strong advocate of soft tubes. He points out that in radiography of the chest a soft tube is necessary to demonstrate a foreign body such as a bean. Naturally, it is impossible in the same plate to distinguish the vertebral outlines in the dense undifferentiated shadow of the spinal column: for this purpose more penetrating rays from a harder tube are essential. The same laws apply in radiography of the facial bones. In order to obtain detail, the softest tube which will give the requisite penetration should be selected. An alternative plan is to allow a gas-filled tube of the Müller type to harden progressively, or to alter the current passing through the Coolidge tube, during the exposure.

W. OLIVER LODGE.

*Optic Nerve in Sinus Disease.* Dr C. W. CUTLER. (*Laryngoscope*, Vol. xxxii., No. 8, p. 576.)

At the edge of the blind spot, the first or marginal visual cells of the retina are connected with the peripheral fibres of the optic nerve. These fibres lie next to the sheath, which is in contact with the posterior ethmoidal and sphenoidal sinuses. Any pathological process will involve the peripheral fibres and is manifested by the production of a peripapillary scotoma (van der Hoeve's sign). The enlargement of the blind spot is therefore one of the most important early signs of sinus neuritis. The occurrence of a central scotoma is not the rule in sinus neuritis, although it is found occasionally at an early stage. Van der Hoeve and de Kleyn examined 59 cases of posterior ethmoiditis and sphenoiditis, and found the enlarged blind spot in 54. It may exist as the only defect in the visual field for a long time, and does not necessarily indicate radical operative measures, though the patient should be carefully watched.

ANDREW CAMPBELL.

# Larynx

## LARYNX.

*The Healthy Epiglottis in Laryngectomy.* KARL KOFLER. (*Wiener Klinischer Wochenschrift*, 4th January 1923.)

From Billroth in 1873 onwards, it has been a common practice to leave the healthy epiglottis in the operation of otherwise complete laryngectomy. Maas, in 1876, advised removal because the epiglottis has no function in deglutition proper.

In a number of cases reported by Sendziak in which the epiglottis was left, either difficulty in swallowing or recurrence of the growth occurred in over 50 per cent. of cases.

There is at present much difference of opinion as to whether it should be removed, and Chiari in his large experience had no settled practice. The author relates a case of his own in which the epiglottis was left, with the result that swallowing of solids was impossible and of fluids difficult. Removal of the epiglottis completely relieved this complication.

The author considers that the epiglottis should inevitably be removed, as after extirpation of the larynx it is a useless organ.

F. C. ORMEROD.

*The Diagnosis of Syphilis of the Larynx.* JOSEF BUMBA, Prague. (*Zeitschrift. f. Hals-, Nasen-, und Ohrenheilkunde*, Bd. II., p. 273, 1922.)

The writer is of the opinion that cases of syphilis of the larynx are often overlooked as such, owing to the observer failing to think of syphilis; this obviously takes place more frequently with patients of higher social rank than in hospital patients. He, therefore, strongly advises the taking of the Wassermann reaction in all uncertain cases, remembering, however, that even a negative result does not always exclude a diagnosis of the disease, which is of such enormous importance. The ulcerative conditions are generally perceptible enough, and when recognised can generally be successfully dealt with. The hyperplastic changes are, however, of greater importance and lead to stenosis and tracheotomy. In regard to treatment, he utters a warning against the use of iodine preparations in the cases of stenosis, and recommends in them the immediate administration of salvarsan or one of its substitutes. He comes to the conclusion that in many cases the diagnosis of syphilis of the larynx might have been made years in advance, if the physician in charge had only thought of its possibility.

JAMES DUNDAS-GRANT.

*A New Method of Hypopharyngoscopy.* A. BRUGGEMANN (Giessen). (*Zeitsch. f. Hals-, Nasen-, und Ohrenheilkunde*, Band IV., p. 169.)

The conical portion of the cricothyroid membrane is transfixed from side to side through the skin with a strong needle by which a thick

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silk thread is drawn through. By means of this thread the larynx can be drawn forwards and the open hypo-pharynx can be inspected by means of the laryngeal mirror in "Killian's position." The skin is first sterilised with iodine, then a half per cent. solution of novocain is injected on each side. This is said to make the proceeding quite bearable. The method is available for both indirect and direct inspection, and also for the passage of the œsophagoscope.

JAMES DUNDAS-GRANT.

### *The Treatment of Laryngeal Tuberculosis by means of the Röntgen Rays.*

L. RICKMANN. (*Münch. Med. Wochenschrift*, No. 45, Jahr. 69.)

The author in his capacity as physician in charge of the pulmonary sanatorium of St Blasien has treated 61 cases of laryngeal tuberculosis by means of X-rays. The great therapeutic worth of this form of therapy lies in its power of inducing cicatrisation and in helping and hastening this tendency when it is in abeyance. If used in suitable cases and with proper technique, the effect is towards cicatrisation and natural healing, and hence it is inappropriate in the exudative and acute destructive processes.

It is principally indicated in the proliferative forms of laryngeal tuberculosis, especially in those cases of subepithelial tubercle which, by reason of the circumscribed hyperæmia or tubercle formation, may be recognised macroscopically. It is also indicated in tubercular small-celled infiltration of the submucous tissue, when there is papillary, epithelial, or deep connective tissue proliferation.

The law that tuberculous granulation tissue is elective to the action of the hard rays applies to the larynx as to other regions. We should strive to provoke just enough reaction to act as an incentive to cicatrisation, and not to cause destruction of tissue. This reaction can and should be induced by a dosage which has no effect on the surrounding tissues.

The writer describes his technique as follows: The larynx is radiated every second day with 8.10 X, the equivalent of 20 to 30 per cent. of the H.E.D. The radiation is carried out by means of the symmetry apparatus of Reiniger, Gebbert, and Schall, and the self-hardening tubes of Müller-Schnellseide. The focal skin distance is 24 cm., and the size of the field 4 cm. diameter. An aluminium filter of 4 mm., a current strength of  $1\frac{1}{2}$  to 2 milliampères and a Bauer quantity meter of 7.8 are employed. The structure of the neck makes it possible to radiate the larynx from the front and from both sides simultaneously, in such a manner that the central rays are certain to traverse the tubercular focus. As the latter is at the most 3 to 5 cm. from the cutaneous surface, the rays lost by absorption and dispersion are relatively small. After six exposures there is a pause of at least three weeks, the radiation being eventually repeated under the strictest clinical observation. It must, however, be noted that the optimal

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dosage, as also the number and the sequence of the sittings, must be determined in each individual case. The anatomical character of the lesion is the decisive factor. Benevolent proliferative infiltrations can bear three sittings each with 20 to 30 per cent. of H.E.D. weekly, whilst ulcerative conditions demand smaller doses and longer intervals. The greater the development of cedematous swelling, the more carefully must the treatment be applied. The writer is decisive in his denunciation of destructive doses in treating this affection, and points out that this treatment must still be considered to be in its developmental stage.

JAMES B. HORGAN.

## *Fatal Injury following Röntgen Radiation of the Larynx.*

V. HÖFMEISTER. (*Münch. Med. Woch.*, No. 49, Jahr. 69.)

The occurrence of three fatalities within eleven months as a direct result of X-ray treatment of laryngeal tumours has induced the author to publish at some length the histories of these cases. In each case the patient was an adult past middle age. One suffered from papilloma which had twice previously been removed by operation. The second case was diagnosed as lupus-carcinoma still in the operable stage, whilst the third case suffered from a large partially ulcerating carcinoma of one ary-epiglottic fold. The radiation was in each case carried out in a manner conforming to the generally accepted principles at present governing this form of treatment. Full clinical post-mortem macroscopic and microscopic records of the cases are given and the author's conclusions may be briefly summarised as follows:—

Late injury as a result of Röntgen radiation of the larynx are of more frequent occurrence than was thought.

The absence of a severe reaction within the first four weeks after radiation does not prove that the dose was not excessive. Even in cases where a single dose has been well borne at the time of administration death may eventually ensue.

Considering the uncertainty and danger of the method, no case of operable carcinoma or papilloma should be treated by radiation. Experimental radiation is absolutely contra-indicated, because the secondary tissue sclerosis caused by the rays renders a subsequent operation impossible.

JAMES B. HORGAN.

## MISCELLANEOUS.

*The Prophylaxis and Therapy of Bronchial Asthma with Concentrated Solutions of Calcium Chloride.* SCHLIACK. (*Münch. Med. Wochenschrift.*, No. 13, Jahr. 70.)

The writer defines bronchial asthma and hay fever as “vegetable neuroses” due to a congenital or acquired perversion in the stabilising relationship between the antagonistic nerve groups, vagus and sympathetic.

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This is probably initiated by a lowering of the calcium content as a result of excessive calcium destruction from disturbances of the internal secretions. By the administration of large amounts of calcium it is possible, for a longer or a shorter period, to increase the calcium content of the blood and to remove for such period the results that accrue when the nervous system is starved of calcium.

The amount of calcium administered must be sufficient to both raise and maintain the total calcium content above the danger limit for the diseases in question, otherwise relapses will occur. The most appropriate calcium salt is calcium chloride ( $\text{CaCl}_2$ ), but it has such a disagreeable taste that it could not be taken continuously in efficient dosage. In "Repocal" we possess a preparation which has a high percentage of calcium chloride, is devoid of unpleasant taste and is easily taken. It consists of an emulsion of calcium chloride with milk fat and white of egg suitably flavoured. It contains 12.5 per cent. of calcium chloride by weight.

Repocal is given in doses of a tablespoonful every two hours in half a glass of milk or water. In this way eight doses or the equivalent of 20 grammes of calcium chloride are given daily. The average dose in cases of medium severity is four to six spoonfuls (10 to 15 grammes of  $\text{CaCl}_2$ ) daily. By means of Repocal the asthmatic attacks are either completely checked or else much ameliorated.

If given during an attack, Repocal is effective in restoring the normal stabilising relationship between the vagus and sympathetic which has been upset by pathological irritation of the vagus. In these circumstances the writer also administers atropine and adrenaline.

JAMES B. HORGAN.

## REVIEW OF BOOK

*Brain Abscess, its Surgical Pathology and Operative Technic.* By WELLS P. EAGLETON, M.D., Newark, N.J. Pp. 297; 40 illustrations. The Macmillan Co., New York.

The author's aims in practice and in writing this interesting monograph may be stated briefly as follows:—

1. To apply the technique, elaborated by Cushing for aseptic brain operations, to the exploration of the cranial fossæ for meningeal or brain abscess.
2. To examine fully all physiological, mechanical and pathological facts which bear on the prevention, evolution and eradication of brain abscess.



## Review of Book

3. To evolve a classification based on the "causative lesion of entrance into the central nervous system," viz., direct continuity of suppuration, thrombo-phlebitic and perivascular extension, extension by secondary infection of the great blood sinuses, and blood (metastatic) infection whether originating in aural, nasal, or more remote foci.

In his "Foreword" the author writes, "Although pathology and treatment are usually dealt with in separate chapters they are in reality one and should be so considered." With this object in view the author has adopted a somewhat unconventional arrangement of his material.

The book is divided into three parts. (I.) "General considerations in Intracranial Surgery." This part includes minute details of operative technique. (II.) "Surgical pathology and operative technique of brain abscess." This includes the pathological classification referred to, as well as clinical and surgical classifications; separate chapters on temporo-sphenoidal, cerebellar, frontal, and metastatic abscesses, on hernia cerebri, and a chapter on "The Protective Mechanism of the Brain." (III.) "Surgical diagnosis." The interweaving of anatomy, physiology, pathology, and surgical technique may appeal to many readers, but the reviewer found it irritating and thinks that the inexperienced student would find the subject far less difficult if the time-honoured order of the text-books were adopted, while the busy surgeon who wishes to know the author's views on certain points, or to compare the results obtained with those got by his own or other methods, will have difficulty in finding and piecing together the information he is in search of.

A careful tabular analysis of the author's cases (50) upon which he bases his matured practice would add greatly to the usefulness of the book.

The plan of operations recommended may be broadly outlined as follows:—

Abscess of the middle fossa:  $3\frac{1}{2}$  ins., nearly square, osteoplastic flap, above and clear of the infected ear—reflected upwards; corresponding dural flap reflected downwards; if necessary, to allow of separation of the brain from the dura mater, decompression by lumbar puncture or puncture of the opposite lateral ventricle by the occipital route; inspection of outer and under surfaces of temporo-sphenoidal and occipital lobes; if a pia-arachnoid abscess is present or an area of dura mater is found connected by a "stalk" to an intra-cerebral abscess, the latter should be evacuated and drained through the area cut off by adhesions from the general sub-dural and sub-arachnoid spaces: if no such connection exists and there is no "macroscopical evidence of cortical involvement," exploration, evacuation, and drainage

## Review of Book

to be conducted through the flap opening, preferably after establishing a barrier to meningeal extension of sepsis around the area exposed.

Cerebellar abscess: anterior third; exposure through Trautmann's triangle; free removal of bone over sigmoid and lateral sinus and lateral lobe of cerebellum; occlusion of sinus by ligature with the aid of an ingenious instrument designed by the author; removal of outer wall of sinus and formation of a large dural flap including the inner wall of the sinus; remainder of operation including ventricular puncture as in temporo-sphenoidal abscess.

Posterior two-thirds of cerebellum: Osteoplastic flap, extending from sigmoid sinus to sigmoid sinus, to be turned down exposing the whole of the posterior two-thirds of the cerebellum; remainder of operation as in temporo-sphenoidal abscess.

Frontal abscess: large osteoplastic flap above the upper limit of the frontal sinus, inspection of under and anterior surfaces of frontal lobe; ventricular puncture usually required; remainder of operation as in temporo-sphenoidal abscess.

The arguments in favour of this procedure must be read in detail before their cogency can be appreciated, but they may be briefly stated as (*a*) danger of sepsis, (*b*) presence of œdema with consequent (*c*) swelling and displacement of brain, (*d*) damming back of cerebro-spinal fluid with distension of ventricles, (*e*) herniation, (*f*) uncertainty as to exact site and connections of abscess, and (*g*) whether the abscess is acute or chronic.

However rational and scientific these extensive operations may seem, the reviewer, and probably most operating surgeons would like, before adopting them as routine practice, to see a careful, detailed, *tabular* statement of all the author's cases with the results obtained. They would want to know whether, in the long run, better and more consistent results could be got than by the simpler means so brilliantly employed by the pioneers of this branch of surgery.

The author has rightly made the avoidance of unnecessary interference with the cerebro-spinal fluid system, and operative trauma of healthy brain tissue two of his principal articles of faith, but is he sure that these can best be adhered to by extensive flap operations and ventricle draining?

Not a single case of complete exposure of both sides of the cerebellum is recorded in the book though this procedure is insistently recommended.

"The author believes that our present knowledge should enable us not only confidently to diagnose the presence of brain abscess, but also, in a large proportion of cases, to determine its location and whether or not it is surrounded by a capsule."

# Letters to the Editors

This may be true, but is not the advocacy of the large osteo-plastic and dural flaps rather a confession that the author still finds early pre-operative diagnosis unreliable?

Is there not still such a thing as a "latent brain abscess." Does any surgeon undertake a true "interval operation" on the brain with a light heart?

The truth is that in the matter of accurate diagnosis, except perhaps in the initial and terminal stages, there is much work to be done and that, except in the matter of the examination of the blood and cerebro-spinal fluid and the vestibular and cerebellar functions, little of value has been added to the facts marshalled by the pioneers of forty years ago. The author, however, has recorded two observations which may prove fruitful, viz. :—

(1) Varying degrees of transient or permanent hemianopsia without hemiparesis of the face and limbs (unfortunately the field-charts given are not above criticism).

(2) The localisation of a temporo-sphenoidal abscess by the radiographic shadow of a collection of gas produced by anaerobic organisms in the uppermost segment of the cavity.

These observations should stimulate systematic careful field of vision taking and radiographic examination in suppurative nasal and aural cases, whether any of the classical symptoms of brain abscess are present or not.

The reviewer hopes that his criticisms will not discourage intending readers, but, on the contrary, will stimulate the careful study of a valuable and interesting contribution to brain surgery

The Bibliography and collected cases of cerebellar and frontal lobe abscesses represent an amount of research which can only be described as colossal.

HUGH E. JONES.

## LETTERS TO THE EDITORS.

TO THE EDITORS,

*Journal of Laryngology.*

*Re Medical Examination for Royal Navy.*

SIRS,—You will agree that we are frequently requested, by doctors and parents, to remove the tonsils and adenoids from the throats of Candidates for the Navy, when, in the absence of that "bogey," the Naval Medical Examination, we shou'd not think of operating.

Feeling confident that there v s an erroneous belief abroad concerning an extraordinarily exacting standard governing the verdicts

## Letters to the Editors

of the Naval Medical Board, I ventured to write to the Director General asking for a ruling on the subject.

Sir Robert Hill very kindly allows me to send you his reply for publication in the Journal. It will, I think, save many youngsters from operations which, in the strict surgical sense, are unnecessary.—Yours truly,  
E. B. WAGGETT.

LONDON.

### SIR ROBERT HILL'S REPLY.

Many thanks for your letter.

It is very seldom that we disqualify a boy for throat trouble alone, and certainly *never* for simple hypertrophy of the tonsils. Of course, adenoids, when discovered, have to be removed before joining Dartmouth, but they would not by themselves disqualify a boy.

In cases of deafness which appear to us to be due to adenoids, we usually turn down the boy and strongly advise the parents to appeal, when we call in a throat and ear specialist. If he concurs that removal of the adenoids will clear up the deafness, the parents are advised to have it done, and the boy comes up for examination and, if all right, he goes in.

In questionable cases with glands and a not too strong chest, a pair of ragged, unhealthy tonsils, would probably prejudice the Board against the boy.

I wonder if I have made myself clear. Do, please, write again if there are any points I have missed.—Yours, etc.,

ROBERT HILL.

MEDICAL DEPARTMENT,  
THE ADMIRALTY, 19/4/23.

TO THE EDITORS,

*The Journal of Laryngology and Otology.*

DEAR SIRS,—I am sorry to inflict a further letter upon you. After all, we are in search of knowledge, and wish only to get the best results for our patients. In spite of Dr Guthrie's modification in the operation on the mastoid, I cannot yet accept Mr Tilley's teaching as sound. It may be because I am far away in the Antipodes where we have, necessarily, to depend almost solely upon our own experience!

The operation is done to get rid of purulent and necrotic processes in the antrum and mastoid, and at the same time to restore the middle ear to its normal, functioning state.

Accepting Dr Guthrie's modification, if it be such, of "Bipping" the cavity before closure, that does not do away with the necessity

## General Notes

of drainage of the middle ear. Mr Tilley says he relies upon an incision in the membrane to do that. But the middle ear is not a simple cavity. It is a series of cavities all presumably, in bad cases, affected and secreting pus. Again, the Eustachian tube is likewise pouring out pus. What is to prevent pus getting into the operation cavity *viâ* the aditus? Pus associated with blood-clot, with "Bipp" in addition, is almost certain to work some ill effect. I have recently had to reopen such a cavity which had been "Bipped" and I found it full of infected material, with very serious necrosis of the temporal bone.

Again, the drainage through the membrane is poor at best, and leaves damage to that structure, even though it may not have a perforation. Posterior drainage is so good that the numerous delicate structures in the middle ear return to their normal state rapidly. My experience of over 400 cases shows such good results in the matter of hearing, that I still hesitate to adopt a method which is said to please the patients and their friends because the post-operative treatment is shortened, and there is no depression behind the ear. What matters the depression or the time in healing if one gets good hearing and complete cure from the septic trouble in the ear?—Yours faithfully,

T. A. MacGIBBON, M.D.

CHRISTCHURCH, N.Z.

*3rd April 1923.*

## GENERAL NOTES

### SECTION OF LARYNGOLOGY—ROYAL SOCIETY OF MEDICINE.

As evidence of the widespread development of the specialty in Great Britain and Ireland, it is not without interest to record that at the recent Summer Meeting of the Section of Laryngology of the Royal Society of Medicine, held in Manchester, representatives were present from the following twenty-seven cities and towns. They are arranged in alphabetical order: Belfast, Birmingham, Blackpool, Bournemouth, Bristol, Cardiff, Cheltenham, Dublin, Edinburgh, Glasgow, Gloucester, Guildford, Harrogate, Hull, Leeds, Leicester, Liverpool, London, Manchester, Newcastle-on-Tyne, Norwich, Nottingham, Oldham, Reading, Sheffield, Stoke-on-Trent, and Worcester.

Brisbane, Queensland, was represented by Dr Graham Brown, at present on a visit to this country.

\* \* \*

Dr Irwin Moore, having resigned his appointment as Surgeon to the Hospital for Diseases of the Throat, Golden Square, has joined the Staff of the Metropolitan Ear, Nose and Throat Hospital, as Assistant Surgeon.

## General Notes

We are indebted to Dr Emil Mayer, New York, for sending us the list of Office-Bearers recently elected by the following Societies in the United States :—

The American Laryngological Association :—*President*—Dr J. Payson Clark, Boston, Mass. *First Vice-President*—Dr Hubert Arrowsmith, Brooklyn, N.Y. *Second Vice-President*—Dr J. B. Greene, Asheville, N.C. *Secretary*—Dr George M. Coates, Philadelphia, Pa. *Treasurer*—Dr George Fetterolf, Philadelphia, Pa. *Librarian*—Dr Joseph H. Bryan, Washington, D.C.

The American Laryngological, Rhinological, and Otological Society :—*President*—Dr Hanau H. Loeb, St Louis, Mo. *Vice-Presidents*—Drs F. N. Sperry, New Haven ; T. E. Oertel, Augusta ; Ray Connor, Detroit ; T. E. Carmody, Denver ; E. R. Lewis, Los Angeles. *Treasurer*—Dr E. W. Day, Pittsburg. *Secretary*—Dr W. H. Haskin, New York City. *Editor*—Dr G. L. Richards, Fall River.

The next Annual Meeting of the Society will be held in St Louis, early in May 1924.

The American Otological Society :—*President*—Dr John B. Rae, New York. *Vice-President*—Dr H. Harold Walker, Boston. *Secretary-Treasurer*—Dr Thomas J. Harris, New York.

\* \* \*

During the ensuing Session 1923-24, the Council of the Royal Society of Medicine has selected certain subjects for the purpose of general debate by all the Sections. Amongst these we note that a Discussion upon "The Possible Substitutes for Cocaine" has been chosen as a subject of discussion. This will appeal specially to the members of the Sections of Laryngology and Otology.

\* \* \*

### THE LATE MR CLAYTON FOX, F.R.C.S.I.

We regret to record the sudden death of Mr Hugh Clayton Fox, which occurred on 13th June. An obituary notice of the deceased will appear in the next issue of the *Journal*.

\* \* \*

### "QUERIES AND ANSWERS."

A suggestion has been made that it might prove useful to our readers if an opportunity was afforded them, through the pages of the *Journal*, of asking for information regarding points of doubt or difficulty, which may, from time, arise in connection with their work.

It is proposed, therefore, to open a correspondence column, under the above title, and to take the necessary steps to supply the information that may be desired.

# The Journal of Laryngology and Otology

(Founded in 1887 by MORELL MACKENZIE and NORRIS WOLFENDEN)

## LYE STRICTURES OF THE CESOPHAGUS.\*

By RICHMOND MCKINNEY, A.M., M.D., Professor of Oto-Laryngology,  
University of Tennessee College of Medicine, Memphis, Tenn.

FOURTEEN cases of lye stricture of the œsophagus coming to one clinician within twelve months is indicative of the frequency of the occurrence of this most distressing condition; moreover, it is a calamity so easily prevented. While the above number of cases have been under my treatment during that period, the average promises to be maintained in the ensuing months.

Twelve of these cases have been in children, who are often the innocent victims of carelessness on the part of their mothers. The latter, usually of the indigent class, are ignorant at times of the grave danger that the innocent-looking can of lye may be to their children. Concentrated lye is put up in cans resembling those containing condensed milk, and as one little girl, nine years old, told me, she drank the lye solution under the impression that it was condensed milk. Furthermore, concentrated lye is inconspicuously labelled as to the poisonous character of the contents of the can; it is an almost unbelievable fact, as I am informed by Dr Chevalier Jackson, that some manufacturers maintain an effective lobby to fight State legislation, having for its object the requirement of change of shape of package and conspicuous labelling of lye cans. Doubtless,

\* Read before the Tennessee State Medical Association, Nashville, Tenn., 11th April 1923.

*Note.*—Lye is generally known in Great Britain as caustic soda.

## Richmond M'Kinney

fear of reduction in sales has something to do with this apparently heartless action, but it is a strange psychology that is indifferent to the prevention of the misery that comes to so many children through a preventable accident. That, however, is one of the sad commentaries upon our latter-day acquisitiveness.

The action of ingested lye solution in producing œsophageal stenosis is so characteristic that the history is similar in nearly all of these cases. There will be little or no difficulty in swallowing, for a varying interval, after the lye has been ingested, the primary burn having healed. There follows, however, progressive increasing difficulty in deglutition, until rather suddenly, perhaps several months or a year after the solution has been swallowed, there is almost complete œsophageal stenosis. This is due to the cicatricial contraction; the victims or their relatives, and sometimes, sad to relate, the physician, are lulled into a false sense of security that, because there was no immediate stenosis, the danger of stricture had passed. Many months and even years of treatment, and fatalities too, might be avoided, if these cases were seen earlier and properly treated so as in this way to prevent marked cicatricial changes and stenosis.

A typical history is found in the following letter, accompanying a case of lye stricture in a young woman of twenty-one, who was referred to my clinic some weeks ago by a physician in Paragould, Arkansas. "One year ago she swallowed a cupful of lye solution by mistake. After her recovery she had no trouble in swallowing for some months; since then, she has had intermittent attacks of dysphagia. Three days ago she found that no food or water was going into the stomach. When I first saw her, I attempted to pass a small rubber catheter into her stomach. It seemed to pass through the stricture and I slowly poured a tumblerful of water into the stomach. She immediately vomited this. The next day we prepared her for an attempt to bougie the stricture, but her weakened condition prevented this. She was put on proctoclysis and nutritive enemata, and has improved considerably."

It is a logical conclusion that these strictures, in general, should be confined to the upper portion of the œsophagus, because there is a natural constriction of the œsophagus at the cricopharyngeal level, which, it might be assumed, would stop the lye long enough to produce a decided burn at this



## Lye Strictures of the Œsophagus

point. Such is not the case, for in most of the patients who have come under my observation, while there may have been a cicatrix at this anatomical constriction, the sites of stenosis were located lower down, frequently occurring in the lower third of the œsophagus, and not always at one, but indeed sometimes, and not infrequently, at two or more localities. One little victim, now happily almost completely recovered, had three long areas of scar tissue in her œsophagus, from the cricopharyngeal level to the abdominal hiatus, which is quite low down in the œsophagus for a stricture of this nature to be found. That the lye solution goes so far down before producing its worst burns may be explained by the involuntary relaxation of the constrictor muscles at the upper end of the œsophagus when the lye irritates the walls, so that the solution uninterruptedly passes down into the œsophagus.

Most of these cases when brought for consultation have a small opening through the stricture, filiform in shape perhaps, and never adequate for proper nourishment; but if an opening can be traced, then the problem of treatment is not so very difficult. If there is complete stenosis, then a gastrostomy should immediately be done, for water hunger may bring death before the problem of dilatation can be worked out and the difficulties overcome.

After gastrostomy in these impermeable cases, no time should be lost in endeavouring to dilate the stricture, because adequate dilatation is the only hope for the eventual recovery of the child. Jackson has emphasised the fact that no case is on record in which a gastrostomy has been done in early childhood, and nourishment maintained in this way, with survival to advanced adult life.

The treatment of these cases pursued in my clinic has always been that of gradual dilatation, rapid dilatation being avoided on account of the danger of rupturing the œsophagus, which, if it occurs, generally means a quick fatality. A preliminary fluoroscopy is always obtained, showing the location and length of the stricture or strictures; dilatation is then begun and continued at regular intervals through a Jackson's or Bruenings' œsophagoscope, preferably by means of Jackson's flexible linen bougies, gradually increasing the size. No anæsthetic of any kind is used in children, but in adults, I sometimes apply a 10 per cent. solution of cocaine to the laryngeal pharynx, to abolish the reflex, and thus to facilitate the passing of the

## Richmond M'Kinney

œsophagoscope. In two or three cases wearing gastrostomy tubes, where per oral bouginage was unusually difficult, I have practised, under light gas anæsthesia, retrograde bouginage through the œsophagoscope introduced through the gastrostomy opening into the cardiac end of the œsophagus. This method is not often required, for usually the œsophagus can be dilated from above, which is far more satisfactory. The string swallowing procedure, used for finding an opening through an apparently impermeable stricture, has been used in some cases; but in very young children, the most frequent victims of this accident, I have had difficulty in preventing their biting the thread in two, even when introduced through the nose. One three-year-old child, although kept under the influence of chlorotone, eighteen hours after the introduction of the thread through the nose, would, in his sleep, work the thread up into his mouth and bite it in two.

Finally, I should like to emphasise one thing of paramount importance. If there is a definite history of the ingestion of lye solution, although, at first, there may be absolutely no symptoms of stenosis, bouginage should be begun promptly and continued over a long period of time, even though there is no appreciable obstruction, for by this means often a miserable existence, or indeed a fatal outcome, may be prevented. If this is not done, cicatricial contraction will follow with its attendant difficulties preventing successful treatment.

## SOME CLINICAL OBSERVATIONS ON THE LINGUAL TONSIL.\*

By J. ARNOLD JONES, O.B.E., F.R.C.S.Ed.

**Introduction.**—During the past few years, my attention has been attracted to the region of the lingual tonsil in those cases which present themselves with vague throat symptoms, such as aching, queer sensations, “bursting feelings,” and the like; also in some cases of dysphagia and of paroxysmal coughing in which the lungs are quite healthy.

A survey of the literature of this subject discloses the fact that it has received little, if any, attention for the last twenty-five years in this country, although what has been written on the Continent and in America has reached considerable proportions. It seemed to me that it would be profitable to ascertain the views of the Section on a clinical condition which, although it deals with the minor laryngological ills of man, presents several points of interest, and, from the patient's point of view, is sometimes of intense importance.

I venture, therefore, to bring before you some clinical observations based on 53 cases observed during 1920, 1921, 1922, and the latter half of 1919, with a view of eliciting discussion. Of these cases, 49 are private and 4 hospital; 34 are female and 19 male. One, only, is a child under fourteen, a female hospital case. In all, the symptoms complained of were directly traceable to the lingual tonsil. In the majority, (38 in number) no other discoverable lesion of the upper respiratory tract was present. Of the remainder (15 in number), 9 showed signs of chronic naso-pharyngitis, 1 had definite suppuration in the maxillary antrum and the ethmoidal labyrinth of one side, 1 had adenoids, 2 had septic faucial tonsils, and 2 had paroxysmal rhinorrhœa; but, in all these cases, removal of the associated lesion was not followed by improvement or cure until the lingual tonsil had also received treatment.

**Predisposing Causes.**—The following have been given as predisposing causes: an unstable condition of the central nervous system; alimentary and bowel disturbance; gout and

\* Paper read at the Summer Meeting of the Section of Laryngology, Royal Society of Medicine, Manchester, 15th June 1923.

## J. Arnold Jones

rheumatism. Further, Cohen believes that there is some connection between the condition of the lingual tonsil and ovarian disturbance.

As regards these points, I can definitely state that, in all my cases, the neurotic element was present in major or minor degree. Alimentary or bowel trouble was complained of in 7 cases, while in 3 a history of gout or rheumatism was elicited. As regards the connection between the condition of the lingual tonsil and ovarian disturbance, one of my lady patients, who complained of violent paroxysmal coughing which she had had on and off all her life, was possessed of such uncontrollable reflexes, and was so nervous under the examination, that I never obtained even a glimpse of the lingual tonsil, so that manipulative local treatment was impossible. I instructed her to use the oily spray which I usually prescribe in these cases and gave her a course of ova-mammoid capsules. The spray gave her a certain amount of relief, but after taking the capsules for about three weeks the cough entirely disappeared. It returned a few months after the capsules had ceased to be taken, to disappear again on resuming them. Since I saw her first, about five years ago, she has had several attacks of her old complaint, but ova-mammoid capsules taken for three or four weeks always cause it to disappear. Two other ladies, one of whom complained of paroxysmal coughing, and the other of a vague feeling of something in her throat, were also benefited by this compound after local treatment to the lingual tonsil had produced comparatively little improvement. In none of my other cases can any therapeutic benefit be directly traced to the administration of these capsules.

**Symptoms and Appearances.**—The symptoms which this condition gives rise to may be placed in three groups:—

- I. Vague pains and aching, sensations in the throat, such as “a tight feeling,” “constant desire to clear the throat,” “the presence of a lump in the throat,” and vocal fatigue sometimes accompanied by huskiness. Thirty-four of my cases come within this group.
- II. Paroxysmal cough, often most intense and persistent, distressing alike to patient and friends. Twelve of my cases come within this group. In all these cases disease of the lungs was definitely excluded.

# Clinical Observations on the Lingual Tonsil

III. Dysphagia, varying from slight difficulty in swallowing to absolute inability to take solid food. Seven of my cases come under this heading.

Two symptoms reported by other observers, viz., hæmorrhage from the vessels in this region and dyspnœa, I have not yet encountered.

The appearance of the lingual tonsil in these cases varies from a condition indistinguishable from normal to that of definite hypertrophy and varix. Four groups may be distinguished :—

- (a) Granular.—In this group the lymphoid follicles are enlarged, giving the whole of this area a granular appearance. It is in fact a moderate general hypertrophy; 13 of my cases come within this group.
- (b) Varicose.—In this group large and prominent veins are seen coursing over the lingual tonsil, sometimes, though rarely, displaying slight nodular thickenings; 3 of my cases are included in this group.
- (c) Definite gross hypertrophy, in which fairly large masses of tonsillar tissue are formed, has occurred in 5 of my cases, but in no case have the hypertrophies been large enough to necessitate removal with the guillotine.
- (d) The combination of groups (a) and (b) has been observed in 8 cases.

This leaves 24 cases in which no departure from the normal could be distinguished.

**Treatment** may be divided into local and general :—

I. *Local*.—In every case I prescribe an oily spray, consisting of menthol, eucalyptus and thymol, to be used two or three times daily. In the majority of cases I also paint the lingual tonsil twice or thrice a week for three or four weeks with a 1 in 40 solution of silver nitrate. If this produces no marked effect I proceed to cauterise the tonsillar area with the electric cautery, making two or three light scars at a sitting, and having one, two, or three sittings. In group III., where definite hypertrophies are present, I proceed at once to cauterise. Should the hypertrophies attain a considerable size, I would remove them with the guillotine; indeed, some authorities

## J. Arnold Jones

advocate surgical procedures even in mild cases of hypertrophy, such as removal of enlarged follicles by a sharp spoon. As the bleeding may be considerable at these operations and not easy to control, personally, I content myself with holding such measures in reserve for those cases in which the hypertrophies are too great to be dealt with by other means.

**II. General.**—If alimentary or bowel disturbance be present, or if there is a history of gout or rheumatism, suitable measures must be taken. To combat the neurosis, which is always present, I give tonics, zinc and valerian, potassium bromide, and, in the case of women, ova-mammoid capsules.

**Results of Treatment.**—In order to ascertain the effects of treatment, I wrote to all my patients enquiring about their present condition. I received forty-one replies, twelve returning no answer. These results I have classified into groups:—

- (1) *Cured, i.e.*, when the patient declares himself absolutely free from all symptoms, and has remained free for a minimum period of six months; 11 cases are included in this group.
- (2) *Much improved*: when the patient says that he is much better, but has occasional relapses; 11 cases come under this category.
- (3) *Improved*: where definite improvement has taken place, but the symptoms still persist in minor degree; 15 cases come under this heading.
- (4) *No better*: Condition not relieved is the result in 4 cases.

It is interesting to take the cases in their groups according to symptoms and observe the effects of treatment in each group separately.

**Group I.**—Comprising the vague aches and sensations.—Out of 34 cases in this group, 6 are cured, 4 much improved, 12 improved, 3 not relieved, and 8 gave no replies.

**Group II.**—Paroxysmal cough.—Out of 12 cases in this group 3 were cured, 4 much improved, 2 improved, 1 not relieved, and 2 gave no reply.

The paroxysmal cough is a source of unending trouble to both patient and friends. It is incessant, comes on at frequent intervals, and sometimes causes real distress at night-time by preventing sleep. A long history is usual. In some cases,

# Clinical Observations on the Lingual Tonsil

to add to the distress of everyone concerned, phthisis has been diagnosed.

**Group III.—Dysphagia.**—Out of 7 cases, 2 were cured, 3 much improved, 1 improved, and 1 made no reply. These cases are perhaps the most interesting. The 2 who were cured both complained of absolute inability to take solid food. They gave a short history of a few weeks' duration. The cause in one case was attributed to the swallowing of some pills, in the other, no reason could be assigned for the condition. The lingual tonsil in one was granular, in the other it presented no departure from the normal. The X-ray report in both cases indicated a condition of pure spasm before food entered the œsophagus. A cure was brought about in both cases by one application of the cautery, followed by the use of the oily spray.

Of the 3 who were much improved, 2 complained of absolute inability to take solid food, while 1 could only take such things as fish and eggs. In no case was there any attributable cause. In 2 cases the lingual tonsil was granular, and in 1, definite hypertrophies were present. The X-ray report in all 3 cases stated that there was no real tendency to obstruction. In the case of the patient with definite hypertrophies, after two applications of the cautery she was able to swallow solid food comfortably for some months, then a relapse occurred. Another cauterisation produced another period of comfort longer than the last, and only the other week I again recauterised. The two patients with a granular condition were so relieved by painting with silver nitrate that they did not wish to have anything further done.

The one patient who was merely improved had complained of difficulty in swallowing, due to choking fits, for eighteen years. The lingual tonsil was granular and varicose. Silver nitrate produced definite improvement, and the choking fits were diminished in frequency.

In only one case (not included in this series) has the diagnosis of lingual tonsil dysphagia proved wrong. In this case, that of a woman of forty, the X-ray report indicated spasm at the upper end of the œsophagus, with no evidence of stricture. The lingual tonsil was varicose. There was no secretion in the pyriform fossa, and the larynx was normal. After being under observation for two months, signs of new growth, rapidly increasing, appeared behind the arytenoids. A gastrostomy was done, and the patient is still alive.

## J. Arnold Jones

In my experience, dysphagia due to an irritable or pathological lingual tonsil is, unfortunately, much rarer than that due to malignant disease of the œsophagus. During the same period in which I have seen the seven cases already recorded, I have seen at least between two and three times this number due to malignant disease of the œsophagus. It may be pointed out in regard to the diagnosis of dysphagia that examination by the œsophagoscope provides an accurate method. This is true, but lingual tonsil dysphagia occurs in intensely neurotic individuals, who are extremely difficult to examine under local anæsthesia, while a general anæsthetic introduces a further definite risk, which I do not think is justified by any further information which may be acquired. Personally, I prefer to rely upon the history of the case, the appearance of the larynx and hypopharynx, the result of an X-ray examination, and the results of treatment.



## A METHOD OF APPLYING EPITHELIAL GRAFTS TO THE MASTOID CAVITY.

By ANDREW CAMPBELL, F.R.C.S.(Edin.), Aural Surgeon, School Clinic, Johannesburg; lately Clinical Assistant Ear, Nose and Throat Department, Royal Infirmary, Edinburgh.

A NUMBER of methods are employed by aural surgeons to graft the radical mastoid cavity with epithelium. If it were possible to apply a graft with success to the whole cavity, an ideal result would follow, with the minimum of after-treatment. Unfortunately, the graft is so difficult to work with that the methods in use do not yield as good results as one wishes. The cutting of the graft is a simple procedure, but its transference to a new surface is difficult, requiring both patience and dexterity to prevent the edges from curling and to slide or place the graft where one wants it. Time is lost in the attempt to uncurl the edges, while blood usually collects in the wound and renders the procedure more difficult. If the graft could be stiffened in some way so that we could cut it into any desired shape or size after removal from the skin, the difficulties would be considerably less.

The following method was adopted in 1917, and I have since used it regularly in all radical mastoid operations except in the few cases where grafting was possibly adding a risk to the patient's recovery. After having controlled all bleeding points, the cavity is well irrigated with saline and packed with  $\frac{1}{2}$ -in. gauze, so as to have a perfectly dry field when the graft is ready. The gauze may be moistened with peroxide of hydrogen in cases which have oozed considerably. The thinnest possible graft, about  $1\frac{1}{2}$  in.  $\times$  1 in., is cut from a convenient surface and allowed to lie on the blade of the razor until a piece of green protective, about 2 in. square, is placed on the surface of the graft. The index finger of the left hand is laid on the upper surface of the protective and blade, and the thumb below the blade. The razor is rotated 180 degrees so that the graft, protective, and index finger come to be on the lower surface of the blade, while the thumb rests lightly on its upper surface, ready to grasp the edge of the graft as it appears on sliding the blade away from the grasping fingers. With a little practice the blade smooths out the graft on the surface of the protective, and it requires very little manipulation with tissue forceps, or other convenient instruments, to be perfectly satisfied that the graft is lying flat and completely stretched on the

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green protective, with its raw surface uppermost. If the graft has been cut too thick, it may be necessary to immerse it in saline in order to manipulate it on to the protective, as the edges probably curl considerably. The uncurling is, however, easy, because one merely unrolls the edge gently on to the protective to which it adheres as soon as the saline has drained off sufficiently.

We have now got a piece of protective 2 in. square and on it a graft  $1\frac{1}{2}$  in.  $\times$  1 in. with its epithelial surface in contact with the protective. With a delicate pair of scissors the graft may now be cut into any desired shape and size, but the protective is still uncut. Once again the edges may require unrolling before the protective is cut about  $\frac{1}{4}$  in. around the graft. The packing is removed from the cavity, the protective and graft seized by one or two pairs of forceps and applied to the dry raw surface. It only takes a moment, and the cavity is temporarily packed rather tightly for a few moments to press the graft home to its bed. If, after removal of the temporary packing, there is any doubt as to the graft being correctly applied, the protective only is gently raised by one of its edges and removed. The graft remains behind exposed to a thorough examination and adjustment. The protective is then reapplied and gauze impregnated with bismuth-iodoform paste is gently packed into the cavity. The grafting does not take more than five to eight minutes. The post auricular wound is completely closed.

The first dressing is usually done on the fifth day, but, if possible, it is best to leave the protective *in situ* till the eighth day, when it is easily pulled out with a pair of forceps. In a fortnight the superficial layers of the graft are shed, and the cavity remains beautifully covered with epithelium. The above method has not failed once during six years, and the number of cases grafted must be well over 60. At the beginning, the graft was applied over the inner wall of the tympanum, but this was discontinued, as hearing was nearly always damaged. At present, as much of the cavity as possible is grafted, except the inner wall and that part of the cavity over which the skin is sutured. The method may also be applied to the modified radical operation, but in these cases dressings must be changed early and frequently. Experience shows that the successes are not quite so uniform as in the radical mastoid operation, due no doubt to the difficulty of disinfecting the tympanic cavity.

## CYSTS OF THE LARYNX.

By E. D. D. DAVIS, F.R.C.S.

CYSTS of the interior of the larynx are sufficiently rare to justify the publication of the following three cases, and this type of cyst appears to differ in many respects from the smaller retention cysts occasionally seen on the anterior surface of the epiglottis and on the aryteno-epiglottidean folds.

The history of Case I., of which Fig. 1 is a drawing, is as follows :—

A woman, aged 50, was sent to the hospital on account of hoarseness of three years' duration. Dyspnœa and stridor commenced a few weeks before observation. A large, pale, smooth cyst filled the orifice of the larynx and obscured the view of both vocal cords. It was sessile and growing from the inner surface of the right aryteno-epiglottidean fold and epiglottis, and did not bulge into the pyriform fossa. On 1st August the cyst was punctured by indirect laryngoscopy, but it was difficult to punch out a piece of the wall. On 8th August the cyst had filled again; the patient was given an anæsthetic (C.E.), and an attempt was made to remove it by suspension laryngoscopy, but the view obtained was unsatisfactory and the cyst was only punctured. No swelling in the neck was detected, and it was thought to be a simple retention cyst limited to the larynx.

The patient went hop-picking and returned on 27th December 1922, when the cyst had filled again and the breathing was more stridulous. It was decided to again attempt removal by suspension laryngoscopy, and, if that failed, to do an external operation. She took the anæsthetic badly with signs of laryngeal obstruction, and, in getting her into position, the stretching of the neck stopped the breathing and a hasty laryngotomy was done, but the patient collapsed and died.

The larynx showed a large biloculated cyst, which was seen at the posterior border of the thyro-hyoid muscle as soon as the neck was opened. This portion of the cyst freely communicated through the thyro-hyoid membrane with that within the larynx. It passed through the thyro-hyoid membrane along the superior laryngeal vessels, and occupied the loose connective tissue space between the posterior edge of the thyro-hyoid muscle and the sterno-mastoid. There was no connection between the saccule or ventricle of the larynx and

the cyst. The stretching of the neck expressed fluid from the outer portion of the cyst to that within the larynx, and the post-mortem showed obvious signs of death from asphyxia.

Professor Shattock kindly examined the specimen, and expressed the opinion that it was a mucous or retention cyst, and that there was no evidence to show that it was a dermoid or cyst of congenital origin.

Case II., which was similar, was shown by Mr Cyril Horsford at a Meeting of the Section of Laryngology of the Royal Society of Medicine on 2nd February 1917, and subsequently operated on by Mr Wilfred Trotter.

A male, aged 46, in August 1915, came to the Royal Hospital for Diseases of the Chest with acute œdema of the left arytenoid and ary-epiglottic fold. There was loss of voice and dyspnoea. The swelling was scarified, and at his next visit, the following week, the œdema had completely disappeared and there was no evidence of disease which might have explained the condition. In August 1916, the patient returned with a large cystic swelling involving the left ventricular band and the left ary-epiglottic fold, and extending into the left pyriform fossa. The dyspnoea was pronounced, and, to relieve his distress, the cyst was punctured with the cautery point. A large amount of blood-stained gelatinous fluid escaped. Until puncture was done it was impossible to punch out a portion of the wall owing to its slippery surface and toughness. Although a large portion of the wall was removed, the cyst quickly refilled and on two occasions burst, with relief to the patient. There has been no material change during the last six months. Wassermann reaction and sputum are negative.

The following is a report of the operation kindly supplied by Mr Julian Taylor from Mr Trotter's Hospital case-book:—

16.3.17.—Operation performed by Mr Trotter under chloroform with a preliminary tracheotomy. An incision was made parallel to the anterior border of the left sterno-mastoid muscle, which was drawn aside. The muscles covering the left ala of the thyroid cartilage were exposed and detached. The outer third of the left ala was removed. The cyst was felt under the constrictor muscles; these were drawn aside and the cyst was exposed; it was dissected out intact without opening the pharynx. The cyst was found to extend in the laryngeal wall down to the ventricle. A small opening was made in the laryngeal wall at the top of the ventricle. This was stitched with fine catgut. The constrictor muscles were sutured over the opening. The skin incision was closed with silk-worm gut, and a drain of gauze wrapped up in protective was inserted.

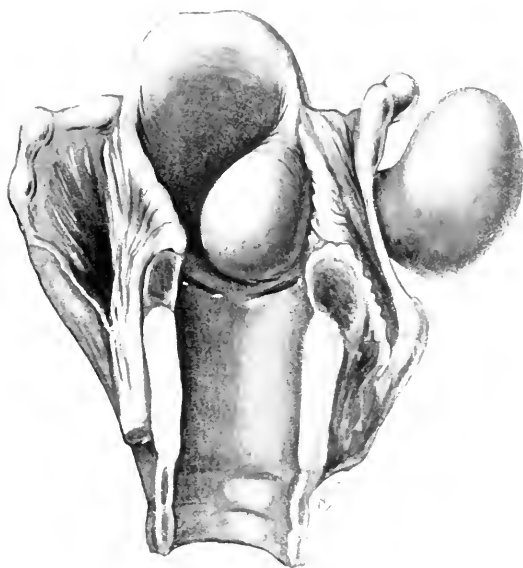


FIG. 1 illustrates Mr Davis' Case of Cyst. (Case I., p. 473.)

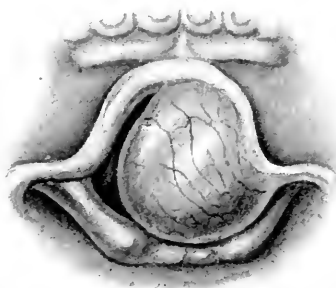


FIG. 2 illustrates Mr Tilley's Case of Cyst. (Case III., p. 475.)



## Cysts of the Larynx

*Pathological Findings.*—The cyst was the size of a filbert nut and contained clear fluid. Mr Taylor reported that the cyst wall consisted of fibrous tissue and unstriped muscle with an epithelial lining. There was a vascular subepithelial layer and the outer part of the cyst wall was also fairly vascular. The epithelial layer was formed of densely packed columnar cells, at the bases of which was a layer of polyhedral cells. Thread-like processes, which looked like cilia, grew from the ends of the columnar cells forming the lining of the cyst. In one place there was a nodule of lymphoid tissue under the epithelium, and over a part of this nodule the epithelium had disappeared.

With the exception of some suppuration in connection with the tracheotomy wound, the patient made a good recovery and the larynx was normal in appearance when seen a few weeks later.

Case III., was recorded by Mr Tilley and Mr Wilfred Trotter at the Meeting of the Laryngological Section on 2nd February 1917, when Mr Horsford's case was shown, and a drawing kindly lent by Mr Tilley is depicted here (Fig. 2). The two cases are similar:—

Mr Tilley's patient nearly suffocated on two occasions and one night he saved his life by putting his finger down his throat and bursting the cyst. It recurred and became distended again, when Mr Tilley opened it and cut out a considerable portion of the wall with laryngeal forceps. The symptoms disappeared and a week later there was nothing to be seen of the tumour. However, in six weeks' time it was re-filling, and one night the patient again nearly choked. A swelling developed in the mid-line of the neck in the thyro-hyoid region, which increased in size and became septic. It was drained for some time, but the sinus would not heal and Mr Trotter therefore took the case over: he found a chronic sinus in the front of the neck over the thyroid cartilage which led down to and passed behind the ala of the thyroid in the region of the thyro-hyoid interval. The condition was thought to be a thyro-glossal cyst. Instead, however, of making its way towards the mid-line under the hyoid bone, it turned laterally and passed into the thyro-hyoid interval extending up but chiefly downwards. The ala of the thyroid was removed until the cyst was traced to the level of the vocal cord. Internal to the cyst lay the very thin mucous membrane of the larynx, and, on the outer side, the ala of the thyroid cartilage.

Mr Trotter was not prepared to offer an opinion as to what the cyst was pathologically, but he described its

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anatomical distribution. It is clear that the swellings which appeared first inside and then outside communicated, and that the internal extension in the region of the upper opening had shrunk on account of inflammation.

The diagnosis of these cases is not difficult, as the appearance and history are so characteristic, so that they can be easily distinguished from the rarer cases of acrocele of the sacculæ of the larynx, but the extension into the neck or other structures cannot always be detected before operation. If the cyst bulges into the pyriform fossa or is of long duration, then it is suspected to be too extensive for intra-laryngeal treatment. Case I. was diagnosed as a simple cyst confined to the larynx, and looked upon with that contempt which obscured the seriousness of the case, and, in view of subsequent events, the cyst should have been removed by an external operation preceded by laryngotomy or by the introduction of an intratracheal catheter.



## INJURY TO THE LARYNX INDUCED BY X-RAY TREATMENT.

By DR A. VAN ROSSEM, HOLLAND.

A GIRL, aged 20, while under X-ray treatment for lymphomata of the neck in the summer of 1915, became hoarse. The mucosa of the larynx was swollen, but there was no tuberculosis. After some weeks the voice again became normal. In the summer of 1921 (six years later), hoarseness again supervened. There was no tuberculosis. Between 1915 and 1921, she was frequently treated by X-rays for ulceration of the skin of the neck. The ulcers healed, but the skin had become thin and the cervical tissues very solid. The hoarseness remained the same for months: otherwise, there were no abnormal symptoms. After a year (September 1921), she came into the hospital in Rotterdam on account of dyspnœa. This disappeared, but she died of pneumonia after three weeks.

*Post-mortem.*—The lungs showed broncho-pneumonia of the inferior lobes, but no tuberculosis. There was no tubercle in the glands. Examination revealed caries of the os hyoideum, and the cartilage of the thyroid was destroyed. Microscopic examination revealed laryngeal perichondritis, but no tubercle. The perichondritis was therefore not tuberculous.

*Résumé of Case.*—A girl, aged 20, treated with X-rays in 1915, becomes hoarse afterwards for a few weeks. In 1921 (six years later), she again becomes hoarse, remained so, and died a year afterwards with a non-tuberculous laryngeal perichondritis and secondary pneumonia.

I consider that the cause of the perichondritis was the X-ray treatment six years before. To defend this opinion, I must recall a paper of Marschik's with the title, "Roentgenschädigung des Kehlkopfes," (Supplement 1921 of the *Monatschrift für Ohrenheilkunde*, Prof. Hajek's Festschrift).

The case described by Marschik is an important one. A patient, aged 36, was treated with X-rays for three years on account of cervical lymphomata. In April 1919, she became hoarse for three weeks and had dyspnœa. There was an X-ray ulcer and a very solid condition of the tissues of the neck. The mucosa of the larynx was swollen, but there was

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no tubercle. Tracheotomy was done with very great difficulty, because of the firm condition of the tissues of the neck. After the tracheotomy the patient recovered. We have here a similar case to our own. In both, the patients with lymphomata were treated with X-rays, with alteration of the tissues into a solid mass; in both cases, a non-tuberculous perichondritis developed. In the case of Marschik, it is certain, as he says, that the X-ray treatment was the cause, and the resemblance is so great that I think we may also assume the same etiology in our case. There was one difference, however, that in our case a sequestrum formed, and, as Marschik says, all the patients with sequestration have died. Marschik gives 7 cases, 4 of his own and 3 from literature. I have found, also, a case recorded by Feuchtinger (*Wiener Laryngologische Gesellschaft*, June 1922).

What is the explanation? Marschik thinks that there is in some individuals a sensitiveness of the larynx to X-rays, and that the cause of the perichondritis is the direct action of the X-rays on the perichondrium. Therefore, in all these cases, the patients are more or less hoarse a short time after the X-ray treatment is commenced ("larynx reaction"). I think that, in my case, the very marked retraction and alteration in the tissues of the neck in the six years between X-ray treatment and death, perhaps furnish the explanation: these alterations are primary, and cause, secondarily, the perichondritis: it is thus possible to understand the abnormally long period of six years.

Prognosis of perichondritis radiotherapeutica (Marschik) is bad, when sequestration has taken place; if not so advanced, recovery is possible, if rest to the larynx is maintained by tracheotomy. Marschik, in the serious cases, believes in nothing more or less than the total extirpation of the larynx.

The X-ray treatment in my case was too severe; Marschik holds the opinion that the intervals between the séances should be sufficiently long. At least eight weeks should intervene. Holzknecht and Holfelder hold the same view. Marschik considers that a patient who has had a "larynx reaction" should stay under observation for at least one year, but this case teaches us that a perichondritis is still possible after six years.

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### ROYAL SOCIETY OF MEDICINE—SECTION OF LARYNGOLOGY

May 4, 1923.

*President*—MR CHARLES A. PARKER, F.R.C.S.Ed.

#### **Two Cases of Laryngo-fissure for Intrinsic Cancer of the Larynx**—Sir ST CLAIR THOMSON, M.D.:—

1. Male, aged 80, shown six months after operation. The right vocal cord was replaced, except for a small portion posteriorly, by an irregular, pink, fleshy growth. The cord moved freely, but the clinical appearances were typical of malignant disease. He had smoked all his life, and still smokes three to four ounces of tobacco every week.

Laryngo-fissure, 21st October 1922; thyroid ala removed; tracheotomy tube left *in situ* seven hours. Patient swallowed easily the same evening and was sitting out of bed next day, playing chess.

The chief interest of this case consists in the age of the patient and in the absence of shock. It was only after careful consultation that it was decided to operate, Dr Frederick Price reporting that there was fibroid degeneration of the myocardium, arterial disease, probably a rather dilated aorta, and attacks of angina during the last five years.

Since the operation the patient has been out hunting, sometimes following the hounds for three or four hours.

2. Male, aged 40, shown one year after operation. The early age of the patient and some difficulty in diagnosis were points of interest.

In January 1922, the patient lost his voice suddenly when trying to sing. In March, when first seen, the right vocal cord was found to be invaded in its whole extent by an irregular, mammillated, projecting cauliflower growth with white points. The cord moved freely; examination for tubercle negative. Diagnosis of epithelioma was made from clinical appearances, and was agreed to by Messrs Tilley and Hope. Voice rest for six weeks resulted in improvement of voice, but in a more marked local condition.

Laryngo-fissure, 19th March 1922, with removal of thyroid ala. Profuse hæmorrhage occurred at the end of the operation and some spouting vessels were ligatured. The operation occupied one and a quarter hours, but forty-five minutes more were spent in checking the bleeding. There was no subsequent hæmorrhage, and the tracheotomy tube was removed the same night.

Patient sat up next day and was walking outside on the fifth day. The voice is, at present, not as satisfactory as in most cases, probably

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due to his failure to report himself from July to September, and to overuse of the voice. This started a compensatory hypertrophy in the ventricular band before a new cicatricial cord had formed. Whispering only was ordered for two months, and the voice is now improving under lessons from Mr MacMahon.

**Laryngeal Case apparently of Epithelioma (possibly Syphilis). Completely healed and arrested under X-ray Treatment without Operation**—Sir ST CLAIR THOMSON, M.D.—

Male, aged 68, first seen October 1921, complaining of gradual loss of voice for nine months. The right vocal cord was quite fixed, being deeply ulcerated and mouse-nibbled, and with a succulent and indolent appearance very suggestive of tubercle. Bronchitis present, but no signs suggesting tubercle; Wassermann reaction negative; blood-pressure 150, auricular fibrillation, no fever; weight, 9 st. 10 lb. He had been getting thinner.

The local condition in December was more suggestive of malignant disease. The right side of the larynx, except the arytaenoid, was still quite fixed; the cord was invaded throughout its entire length; there was a small red granulation in the anterior commissure, and a suspicious area in the right interarytaenoid region. The ventricular band and the arytaenoid were not invaded.

Mr Trotter considered that, in view of the extension and the patient's age and feebleness, operation was not justifiable. In January 1922, patient reported that he had seen Sir James Dundas-Grant, who had removed a portion of growth endolaryngeally which was reported to be malignant. On 17th January, the condition seemed worse. There was a gland the size of an almond on the right side of the neck; the right side of the larynx remained quite fixed, the arytaenoid was enlarged and infiltrated with a slight defect at its summit. The right ventricular band was red and infiltrated, and concealed a good deal of the right cord, and there appeared to be subglottic extension.

The patient was transferred to Dr Knox for X-ray treatment. In June 1922, patient was looking better; had gained weight; no gland in neck. The appearances of the larynx had changed in a most remarkable way. The right arytaenoid was quite normal and as good as the left; it moved, but the right side of the larynx remained fixed by infiltration of the ventricular band. Still, this was diminished so that the anterior third of the right vocal cord was visible, and was seen to be quite healthy. The posterior two-thirds of the cord, on its upper and inner surface, were occupied by a clean, deep, triangular ulcer. There was a little ulcerating crinkling in the interarytaenoid region. The condition again appeared tubercular.

In November 1922, the larynx had advanced to the condition in which it has now remained for five months. No glands in neck; no

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fresh disease anywhere in the larynx, and the left side remains normal. On the right side the arytaenoid and the inter-arytenoid area are again normal. The right endolarynx is quite fixed, as if the vocal cord was adherent to the outer wall. The ventricular band is not infiltrated. Below it, there appears the anterior two-thirds of a fixed white vocal cord, or the cicatricial cord which has replaced the natural one. The present appearances are, indeed, not unlike those left after a successful laryngo-fissure for intrinsic cancer. The general health is satisfactory, except for the cardiac condition.

The case is extremely puzzling. It may be recalled that the laryngeal trouble started two and a quarter years ago. Drawings made by three independent observers show a decided and extensive lesion. The process has apparently completely cicatrized. If the microscopic specimen is to be thoroughly relied upon, it looks as if retrogression and complete scarring had been effected by the X-ray treatment.

As recorded, the laryngoscopic appearances have at times seemed more tubercular than malignant. (Spontaneous healing, occurring so rapidly in five months and leaving a fixed cord, is unusual in tuberculosis.)

Could it have been luetic in spite of the negative Wassermann? (Specific conditions sometimes heal spontaneously and rapidly.)

Sir JAMES DUNDAS-GRANT said that tuberculosis had been suspected at the time that he (the speaker) had removed the outgrowth on the vocal cord for examination, but the microscopic section and photomicrograph had shown its typical epitheliomatous nature. The success of Dr Knox's treatment of this case by X-rays alone had been most brilliant.

Dr P. WATSON-WILLIAMS asked whether the exhibitor usually removed the ala, and whether any advantage was gained by doing so; also he inquired as to the length of the X-ray sésances in the third case.

Mr A. J. M. WRIGHT asked whether Sir St Clair Thomson ever sutured the wound in the larynx. If not, had he any theoretical objection to the practice? In a recent case he (the speaker) had inserted catgut stitches, and had had no reason to regret it.

Dr ROBERT KNOX said that the third patient had been treated by the ordinary technique employed for several years at King's College and the Cancer Hospitals, except that a larger dose at more frequent intervals had been employed. The radiation was the most penetrating which the hospital apparatus, a 16-in. coil, would yield, increasing up to a 10-in. spark, approximately 130,000 to 150,000 volts. The filtration was through 8 mm. of aluminium, and a pad on the skin provided a second filtration to prevent secondary radiations damaging the skin. Twice a week, for a month, patient had a full dose of the rays directed on to his larynx, first from the left side, then from the right, followed for several months at fortnightly intervals. Altogether, he had had twenty hours of exposure, spread over a considerable time. A striking feature was that the frequent exposure had

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produced no effect on the skin. It was a treatment he had used in other cases—*e.g.*, in tuberculous glands—with a favourable response. Similar treatment had been used in another case of sarcoma of the pharyngeal wall, sent to him by Dr Dan M'Kenzie eighteen months ago. The same technique had been employed over a long period, and the growth had disappeared. These two cases were the most successful he had had.

Mr A. J. HUTCHISON referred to six of his patients with intralaryngeal cancer, upon whom Sir St Clair Thomson had operated. One operated upon three months ago had had a growth which had extended to the front of the cord, and had probably crossed the middle line. In this case Sir St Clair Thomson divided the thyroid cartilage on the opposite side of the middle line, and so far there had been no recurrence, though it was too early yet to be certain of the result. The success of these operations had been very striking. Of the six patients he (Mr Hutchison) had sent to the exhibitor, he had lost sight of one, one had died of pneumonia several years after the operation, one, an alderman, was now able to preside at meetings and to make himself heard in a large room, one was a former policeman, now aged over eighty, and the others were well.

Dr ANDREW WYLIE inquired why Sir St Clair Thomson had discontinued the practice of removing a piece of the growth—especially if projecting—for microscopical examination? The omission to do so had resulted in his (the speaker's) hands in one or two mistakes; *e.g.*, in one case he had performed laryngo-fissure and then found that the condition was tuberculous; he had seen two similar cases in the practice of others in which this mistake was also made. It was a simple procedure to remove a piece of growth endolaryngeally. Sir St Clair Thomson had referred to the free mobility of the cord, which indicated that the cord was not deeply involved by the growth, otherwise there would be a want of movement, not necessarily a fixed cord, but sluggish action.

Dr WILLIAM HILL said that he also had performed laryngo-fissure in a case of tuberculosis of the larynx; he had found it a good form of treatment where the disease was chronic and limited to one cord, a form which in appearance simulated malignant disease. In such a case there was no indication to remove the thyroid ala.

Mr E. D. D. DAVIS asked how many cases of laryngeal carcinoma Dr Knox had treated by X-rays and, in how many, had good results been obtained? Some patients came to hospital for the first time suffering from urgent dyspnoea, and requiring tracheotomy; he (Mr Davis) had had four such cases within three years. Was there any possibility in these cases of a complete removal of the growth by laryngo-fissure? In two of the cases the extent of the growth had been determined by laryngo-fissure, but complete laryngectomy had been necessary because the growth had invaded the lateral wall of the larynx. In the other two, tracheotomy had been performed, after which the patients had refused laryngectomy. His own experience had been that if there was urgent dyspnoea in a case of carcinoma, it was generally inoperable by laryngo-fissure. If he had another case where tracheotomy was urgent, he would attempt to remove the growth at the time of the tracheotomy.

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Mr MUSGRAVE WOODMAN remarked on Sir St Clair Thomson's low mortality in these operations. Sir St Clair Thomson had operated upon a male patient of his (the speaker's), a fat, florid, somewhat alcoholic man, who had septic tonsils and a septic mouth. Yet he had done extremely well, and had been out-of-doors at the end of the week. With regard to Dr Wylie's remarks on endolaryngeal removal of a portion of the growth for microscopical examination, he (Mr Woodman) would remind Dr Wylie of the case of the Emperor Frederick of Germany, and the history and treatment recorded by Sir Morell Mackenzie in his publication, *Frederick the Noble*. Sir Morell Mackenzie had removed portions of the growth on several occasions, and they had been microscopically examined by Virchow and others and pronounced non-malignant. He (Mr Woodman) considered that the patient had died from lack of application of this successful operation, and as a result of too much dependence being placed on the opinion of the pathologists.

Mr HAROLD KISCH said that the oldest patient upon whom he had performed laryngo-fissure was a male, aged 79—now 82. The operation had presented no difficulty and had occupied twenty-five minutes. In this case some delay in the healing of the tracheotomy wound had occurred owing to ossification of the rings of the trachea; otherwise the patient had done well.

Mr CORTLANDT MACMAHON said that he had spoken on the subject of the training of the voice after operation for intrinsic cancer of the larynx before the Medical Society of London in 1919, when several members now present had heard his remarks. The line to adopt in the re-education of the voice was contraction of the sternothyroid and sternohyoid muscles in order to sink the larynx and so get relaxation of the uninjured cord. The styloglossus, stylohyoid, palatoglossus and palatopharyngeal muscles, being hypertrophied through overuse, prevented the descent of the larynx. Therefore, in a bad case he (Mr MacMahon) employed the fingers of his right hand so as to depress the back of the tongue; in mild cases he advised the patient to use a glass tongue depressor. In a few weeks after this procedure a marked descent of the back of the tongue and larynx was produced. In many cases of chronic pharyngitis and laryngitis, the appearance of the hypertrophied palatopharyngeal muscle was like an inverted V, and after treatment an inverted U. The sternothyroid and sternohyoid muscles became so strong that they sank the larynx and then the voice became deep-pitched and the vibrations were produced with very little effort. One of Sir St Clair Thomson's patients whom he (the speaker) had seen that day was better, but still had poor vocal technique, the chief fault being overbreathing, which raised the upper chest and caused general rigidity of the throat. By improving the technique of the production of the voice, considerable comfort and increase of tone would be obtained. Underlying the vocal treatment of all forms of throat affections was the physical relaxation of the muscles above the larynx and the acquirement of a considerably lower pitch of voice.

Dr KNOX (in reply to Mr E. D. D. Davis) said that he had not yet treated many cases in the way he had described. He had treated a number of cases of patients suffering from advanced laryngeal carcinoma with the

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object of affording some palliation. The case just described was one of the first he had had in which more than a palliative result had been obtained, and he had been stimulated to try it by the reports from continental centres in which curative effects were claimed for high voltage radiations administered in large doses. The question of the duration of the dose was always an important one. A single large dose was advocated by some authorities, three to six hours at one sitting ; others preferred to give the large dose in parts, of one hour each, on succeeding and alternate days. The latter method appeared to be the preferable one, because it did not exhaust the patient so much, and acted quite as favourably upon the local condition.

Sir ST CLAIR THOMSON (in reply) said that the remarks had shown the great advantage of discussing a number of similar cases the same afternoon as had been suggested to-day by Mr Woodman at the Council Meeting. Referring to Dr Watson-Williams' query, Sir St Clair Thomson said that he now always removed the thyroid ala, and he was quite satisfied with the procedure. Of sixty cases in which he had performed laryngo-fissure, eight were 70 years of age, and all recovered from the operation. One had died of cerebral hæmorrhage many years after the operation, and six were still alive and well. Mr Hutchison had sent him a number of cases, and the fact that six patients had come to him from one town showed that the condition was fairly common. Some cases suspected to be malignant were found, after waiting and watching, to be tubercular. In reply to Dr Wylie, Sir St Clair Thomson said that his records showed that in less than half his sixty cases mobility of the cord was affected. If one waited for the cord to be fixed, one was waiting for the patient to die. Sir Felix Semon and others maintained that in the majority of cases a fixed cord was characteristic of this condition ; but more than half of the speaker's cases were operated on long before the growth had infiltrated and fixed the cord. It was this teaching concerning fixation of the cord which retarded early recognition of these cases. The reason he did not remove a piece of growth for microscopical examination before operation was, because it was impossible to remove a piece from an embedded growth in a vocal cord without doing so much damage to the cord that one might as well perform laryngo-fissure at once. He always removed a portion for examination, if it could be done satisfactorily. There were only fourteen cases out of his sixty in which he considered it was feasible to remove a portion. When the growth was subglottic and embedded, the portion which presented was simply inflammatory tissue. In fourteen of his cases, two were reported microscopically to be innocent, but he went on with the operation, and the disease was found to be malignant. He had recorded and published every one of his cases. The death-rate was three ; one of the patients—a very disappointing case—died of rupture of the œsophagus, caused by vomiting. He agreed with Mr E. D. D. Davis, that when a patient was found on first examination to have stenosis, the case was suitable only for laryngectomy. He (the speaker) pleaded for an early diagnosis. He had made only one mistake in diagnosis, a case not included amongst the sixty now referred to. The patient had a negative Wassermann reaction, lungs and sputum gave negative results in tests for tubercle, and the patient was a hale and hearty policeman. When the larynx was



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opened, he (the speaker) felt the cord and it was soft, but still he thought it must be malignant. He removed the growth along with the cord, and it turned out to be tubercular. Three months later, tubercle bacilli were found in the sputum, and the patient had taken a long time to get well. As to the interesting case "cured" by radium, he (Sir St Clair Thomson) thought the right attitude was to "wait and see."

**Tuberculosis of the Larynx cured Seven Years ago by Silence and Galvano-Cautery**—Sir ST CLAIR THOMSON, M.D.—Male, aged 39, was admitted to Midhurst in February 1915, with disease in the right lung and tubercle bacilli in the sputum. There was deposit in both ventricular bands, their edges being ulcerated; both vocal cords were pink and abraded. Silence was not kept strictly at first; the larynx became worse, and fever developed. Hence, five months after admission, the whole larynx was infected; the vocal cords became red and swollen, with ulcerating deposit over each vocal process and posterior half of each cord, invading the edges of the ventricular bands. It required six months' further silence and sanatorium treatment before the larynx was sufficiently quiet to warrant treatment with the galvano-cautery. This was applied three times—December 1915; January 1916; and February 1916. In March 1916 (*i.e.*, thirteen months after admission), he was allowed to talk, and in May 1916, the larynx was quite cicatrized and has remained sound for seven years.

The patient subsequently served with the Army in France as a military chaplain. His health is excellent, and he fulfils all his duties actively.

**Healed Tuberculosis of Lung and Larynx**—Sir ST CLAIR THOMSON, M.D.—Female, whose larynx had healed by silence and galvano-cautery. The case required eighteen applications of the cautery between August 1912 and May 1917. The larynx has since remained scarred. Patient was shown at a meeting of the Section in June 1921, as a healed case, and it was noted that there was some stenosis and shortness of breath. This increased slowly, and required a tracheotomy on 12th October 1922.

She can now walk for miles and climb stairs; excellent health; carries on work easily in a post office, wearing a low (Durham) tracheotomy tube with a speaking valve in it.

Sir JAMES DUNDAS-GRANT said he deprecated using the galvano-cautery in the interarytæmoid space, because of the risk of setting up cicatrization, which might contract the glottis. He used it freely in other parts of the larynx. In the case shown of "Healed Tuberculosis of the Lung and Larynx," it was fortunate that the cauterization had been carried out high up in the larynx, and that the cicatricial band which resulted had been well above the level of the vocal cords. In the interarytæmoid space, treatment

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a little less searching should be tried, such as trichloroacetic acid, which acted well on tuberculous outgrowths and caused less cicatricial contraction than the galvano-cautery. When he had first taken charge of the throat cases at Brompton Hospital, he had expected to find the tuberculous patients getting progressively worse, but that did not prove to be the case, for large numbers had improved very much, and some got well. Much could be done for these patients by paying attention to modern details of treatment. The "silence" treatment was more important than anything else. Some time ago he had shown before the Section a patient in whose case subglottic infiltration had disappeared with treatment: she had been in a sanatorium, and had been sent away because it was considered that nothing more could be done for her. In her case the greatest benefit was derived by syringing through her nose a solution of eucalyptol 1 part, in almond oil 20 parts; this trickled into the larynx, trachea, and ventricles. Another plan was to inject, by an intralaryngeal syringe, a solution of argyrol: he had seen improvement in subglottic infiltration within a week after this had been done. A mixture of anæsthesin and orthoform inhaled into an œdematous larynx seemed to diminish the degree of œdema, and patients were enthusiastic about the relief from pain afforded by this. Even a cancer patient said he felt a different man after using it in conjunction with Dr Knox's treatment.

**Case of Epithelioma of the Vestibule of the Nose after Treatment by Radium**—Sir JAMES DUNDAS-GRANT, K.B.E., M.D. —Female, first seen on 5th July 1922, complaining of soreness and obstruction in the left nostril. A pale, warty growth protruded, and a piece of it was removed for microscopical examination. It was reported to be epithelioma.

The patient has been continuously under treatment by Dr Knox with radium, and after some months a portion of the stump of the growth was removed for microscopical examination; it showed changes in the nature of the epithelial cells produced by the radium as follows: "Tissue shows an epithelioma, one aspect of which reveals a superficial ulceration. The cells of the superficial epithelium are vacuolated and necrotic, and there is a well-marked invasion of polymorphonuclear leucocytes, together with small areas of hæmorrhage. The corium shows, in addition to polymorph cells, granulation tissue cells and fibroblasts. The epithelial layers on the side opposite to the ulcerated surface are little affected."

Dr ROBERT KNOX said that apparently the case was one of rodent ulcer; it had been examined by a pathologist, who had reported it to be one of epithelioma. The changes seen in the section were typical of those produced by radium or X-rays, and he did not think it was material which form of radiation was used, provided the dosage was right; the important point being the amount of radiation absorbed. Radium was the more easily applied, as a small tube could be introduced into almost any space, and in the accessory sinuses it could be applied in small tubes or applicators

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specially constructed for the case. If the affected area was extensive, one bombarded it with the radiation from an X-ray tube in addition to the local application of radium.

**Case of Fibroma of the Nose**—LESLIE POWELL, M.B., B.C.—Boy, aged 13, had suffered for three months from nasal obstruction, causing mouth breathing and snoring, also on one occasion from slight bleeding. Transillumination showed both maxillary antra clear. A tumour was seen through the right naris, attached posteriorly to the floor and the adjacent parts of the choana. Removal of the growth, in March 1923, was accompanied by free hæmorrhage, which soon ceased. The pathologist reported a pure fibroma. On 29th March, a recurrence on the inner wall was removed: a further recurrence was removed later, and was found to be attached to the ethmoid region. The nares now appear to be quite clear of growth.

Mr FRANK ROSE asked whether this case had been examined under an anæsthetic, in order to discover the exact point of origin of the growth. The notes of the case suggested that it was attached to and growing from the posterior part of the septum, but that was unusual. He had examined several cases, and his experience was that the growth was attached to the outer wall of the nose, not primarily to the septum.

Mr LESLIE POWELL (in reply) said that he had removed the original growth under an anæsthetic; it originated from the inside of the naris, not from the nasopharynx, and was attached to the nasal floor and septum. He removed it with scissors, inserting his fingers into the nasopharynx as a guide, since he was unable to see what he was doing. Later, he was able to see the position from which it was growing owing to a small piece left behind, and it was not from the outer wall. He thought he would try to eradicate it by diathermy.

**Foreign Body removed from the Trachea of a Child, aged 6 months**—H. SMURTHWAITE, M.D.—It was known that the child had swallowed the little round, flat whistle, which had become detached from her rubber doll, but no notice was taken at the time, as she seemed none the worse. Some four weeks later, the child's breathing became embarrassed and she was sent to the clinic. An X-ray examination revealed a foreign body at a level with the entrance of the left bronchus. The smallest sized bronchoscope was inserted and the whistle was plainly seen, but could not be extracted with the forceps at hand because they obstructed the view. However, an improvised instrument was made and the foreign body successfully removed.

Dr IRWIN MOORE said that the successful removal of this foreign body in so young a child demonstrated the principle that Chevalier Jackson had so often emphasized, namely, that in removing foreign bodies the operator should not restrict himself to any one instrument, or method, but should carefully consider the problem of extraction which presented itself, and

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devise the best means to suit each particular case. He (the speaker) warned members of the danger of using hooks for extracting foreign bodies from the lungs, and referred to an experience which he had shared with Sir St Clair Thomson, and recorded by him. During an attempt to loosen, with Killian's hook, a tooth accidentally inhaled and firmly impacted in a secondary bronchus of a child, the hook had caught in a bifurcation beyond the tooth, and all efforts to extricate it had failed. After a considerable time of great suspense and anxiety, the hook had to be torn out of the lung, fortunately causing only slight traumatism and no after symptoms, the tooth being later successfully removed by lower bronchoscopy. What might have happened if a vessel in the lung had been torn can be conjectured. Realising the dangers of such hooks, with curves greater than a right angle (such as Killian's and the one now shown), he had designed a number of probes and hooks which could be safely employed in the lungs, and these had been included in his armamentarium. Another interesting case, not yet recorded, in which he was consulted by a colleague, exemplified the importance of dealing with every foreign body as a mechanical problem. An adult male patient, with an old stenosed syphilitic larynx, wearing a tracheotomy tube at night and a vulcanite obturator by day, accidentally aspirated the tracheal portion of the obturator (which had become separated from the neck shield through loosening of the screw) into a secondary bronchus, where it had become firmly impacted, point downwards, presenting to the bronchoscope the circular base, with a diameter greater than the possible opening of any forceps, so that all had failed to grasp it. A long probe had been immediately made with a screw thread corresponding to the screw still attached to the obturator plate, and by passing this probe through the bronchoscope and screwing it into the worn hole in the obturator, it was possible to withdraw the foreign body.

Mr SMURTHWAITE (in reply) said that he had carefully considered what might happen in the use of a hook in the air or food passages. It would be seen that in the instrument shown, the hook was blunt and could hardly do damage to the tissues. He had practised beforehand with this instrument by removing from a rubber tube a foreign body similar to the one in this case.

### **Case showing Results following the Accidental Swallowing of Sulphuric Acid in a Patient with Syphilitic Laryngitis**

—C. GILL CAREY.—Male, aged 56, first seen in July 1922, complaining of hoarseness of six months' duration. With some difficulty a view of the larynx was obtained. The greater part of the right cord was occupied by a deep ulcer with sharply defined edges; on the posterior third of the left cord there was a small, smooth swelling. Wassermann reaction strongly positive. In October 1922, while under treatment for his laryngeal condition, he accidentally swallowed some sulphuric acid. Within a month of the accident he began to experience difficulty in swallowing, and when seen again he could only swallow fluids. Œsophagoscopy showed scarring of the hypopharynx and a fibrous diaphragm occluding the right half of the œsophagus about 2 cm.

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below the cricoid. Dilatation was effected through the cesophagoscope. Improvement in swallowing followed, but subsequent dilatation by the passage of bougies was unsatisfactory owing to the frequent impaction of the tip in a cul-de-sac at the side of the stricture. Dilatation under vision was therefore induced on several occasions, with some improvement. In spite of energetic antisyphilitic treatment, including six injections of arseno-benzol, very little change took place in the larynx. Moderate stridor and dyspnea on exertion were always present. On 24th February 1923, cedema of the glottis followed the passage of a bougie and a tracheotomy had to be performed, since which the ulceration has been steadily healing, but the airway is poor. Large bougies can now be passed through the cesophageal stricture, but there is still moderate dysphagia. Suggestions as to further treatment of the larynx and cesophagus are invited.

Dr WYLIE suggested the local application of a solution of copper sulphate so as to reduce the cicatricial tissue in the larynx. He did not think it was possible to dispense with the tracheotomy tube.

**Swelling in the Nasopharynx on the Right Side, displacing the Soft Palate downwards.**—W. M. MOLLISON, M.Ch.—Female, aged 23. Pain in the right ear commenced a year ago, for which, two months later, she was treated at Golden Square Hospital. A month later the pain spread to the right side of the face. Removal of adenoids, four months afterwards, relieved the pain in the ear for a time, but the pain in the face remained. The patient was first seen at Guy's Hospital, by exhibitor, in March 1923, still complaining of severe pain in the right side of the face and in the right ear, with some deafness. The swelling in the nasopharynx was then observed. Wassermann reaction positive. A portion of the growth removed was microscopically reported to be sarcomatous.

Mr T. B. LAYTON (in the absence of Mr Mollison) said that advice was asked as to what should be done. Sir Charters Symonds had seen the case, and advised that the pathologist's report should be ignored and the case treated as one of syphilis.

Sir JAMES DUNDAS-GRANT said that the enlarged gland made the case appear worse than it really was; he did not think the enlargement was connected with the disease in the nasopharynx, but believed it was caused by a septic tonsil, which should be enucleated.

**Two Cases of Paralysis of the Left Vocal Cord and Left Half of the Palate**—Sir JAMES DUNDAS-GRANT, K.B.E., M.D.—Male, aged 32, suffering from neurasthenia, developed hoarseness about a month ago. Examination revealed paralysis of the left vocal cord and left half of the palate. Inquiry elicited the history of a primary syphilitic lesion a year ago, followed by eruptions. The patient is

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being treated for the specific disease at a special hospital. The laryngeal condition is in all probability an early syphilitic involvement of the vagus, above the region of the pharyngeal branch. There is slight facial paralysis on the right (opposite) side. Taste (glossopharyngeal and chorda tympani) is impaired on the right side, but normal on the left. The conditions on the right side are due to suppuration in the right middle ear.

Male, aged 46, recently seen suffering from dysphagia, especially liquids. There is almost complete immobility of the left vocal cord, and there is paresis of the left half of the palate: the glossopharyngeal taste is deficient on the left side. The larynx is otherwise normal. Wassermann reaction positive. Since taking mercury and iodide of potassium for a week, the patient has felt better and has less difficulty in swallowing.

**Sarcoma of the Tonsillar Region treated by X-rays after Partial Removal**—Sir JAMES DUNDAS-GRANT, K.B.E., M.D., and DAN M'KENZIE, M.D.—Male, aged 67, had suffered from throat trouble since September 1920; partial removal of a sarcomatous growth was effected in November and December 1920 by Dan M'Kenzie, who referred him for X-ray treatment to Dr Robert Knox. The treatment was commenced in September 1921. In the beginning of 1922, a pale, irregular swelling was observed below the right tonsil, but in May there remained little except pale, firm fibrous tissue. When first seen the right cord was paralysed. In May 1922, the movements of the larynx were normal. In November 1922, an erythematous patch with circinate edge was observed on the right half of the soft palate, which was probably due to irritation caused by smoking, as it disappeared when the patient discontinued the habit.

Dr R. KNOX said he had already alluded to this case. The original growth was in the pharynx, and the tonsillar condition was a recrudescence. Dr M'Kenzie had operated twice upon the case, and the microscopic examination confirmed the diagnosis of sarcoma. It had been under treatment eighteen months, and the growth had disappeared under X-ray treatment. The patient was attending the Cancer Hospital for X-ray treatment, and was under the joint observation of Sir James Dundas-Grant and himself. Sarcoma was more responsive to X-rays than were other growths.

**Ulceration of the Left Tonsil; Case for Diagnosis**—H. BELL TAWSE, F.R.C.S. *At Meeting of Section, 3rd November 1922.*—Male, aged 25; about eleven months ago the mouth became tender; small ulcers appeared on lips, with a larger one on the dorsum of the tongue, and persisted for three months. Some carious teeth were removed, the assumption being that they were the cause of the ulcers. Six weeks later the lips and tongue had healed, but soon

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afterwards an ulcer developed on the left tonsil, and was present when first seen by exhibitor on 28th June 1922. The ulcer involved practically the whole tonsil, spreading on to the tongue, and had a punched-out appearance, the floor being covered with a yellow slough. On the middle of the dorsum of the tongue was a small, shallow, painful ulcer. No laryngeal lesions were present. A papular eruption mixed up with acne pustules was scattered all over the trunk and limbs, but this had been present for about two months.

Tertiary syphilis was diagnosed, and potassium iodide, 15 gr. t.d.s., was prescribed. (Three Wassermann tests proved negative.) No improvement in fourteen days. Mercurial inunction and novarseno-benzol injections were next tried, and potassium iodide was discontinued. Fourteen days later the tonsillar ulceration was rather worse, and numerous ulcers had appeared on the gums. Inunctions discontinued; potassium iodide again prescribed, 30 gr. t.d.s.; novarseno-benzol injections continued. Wassermann test still negative. No tubercle bacilli in sputum after repeated examinations. No lesions in the lungs could be found, nor Vincent's spirillum.

Section of piece of tonsil removed shows only chronic inflammatory changes with a good deal of fibrosis, and some infiltration of the mucous membrane with small round cells. Actinomycosis not found.

Swabs from ulcers on tongue and tonsil and cultures showed pneumococcus mucosus, micrococcus catarrhalis, and various streptococci. Glanders bacillus negative.

The dose of potassium iodide was now increased to 60 gr. t.d.s., and in three weeks the ulcer on the tonsil was almost healed. During this time the novarseno-benzol injections had been continued. Three weeks later ulceration had returned and had spread downwards, involving the entire epiglottis, which was swollen, oedematous and sloughing. The whole ulcerated area was freely cauterized with the electro-cautery, the potassium iodide was continued, and the patient was sent to the seaside. In a month's time the epiglottis was healed, and the tonsil was almost healed.

The patient was well until a fortnight ago, when the ulceration of the tonsil recurred. Two injections of autogenous vaccine (detoxicated) prepared from throat swabs were given, at intervals of one week, on the last occasion followed by very marked local reaction with abscess formation. The vaccine was discontinued. Now X-rays are being applied to the left tonsillar region, and potassium iodide, 30 gr. t.d.s., is being given.

Mr HERBERT TILLEY said that he regarded the condition as a form of tuberculosis.

Sir JAMES DUNDAS-GRANT said he thought the case was tuberculous. He had had a case in which one half only of the larynx had been involved,

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suggesting epithelioma, but he made a diagnosis of tuberculosis. The patient had disappeared, and, ultimately, had been sent to the cancer hospital. He (the speaker) had again seen the patient, and had removed a portion of tissue from the left side of the epiglottis and found that it contained giant cells, although there had been no pulmonary signs, and no tubercle bacilli had been found in the sputum.

Mr BELL TAWSE (in reply) said he regarded the condition as a mixed infection of tubercle and syphilis. He would report further.

*At Meeting of Section, 2nd December 1922.*—Patient was again shown to the members, as there had been a new development in the case. A large ulcer, covered with a whitish slough, had appeared on the anterior pillar of the fauces, and was spreading on to the adjacent part of the palate.

Sir JAMES DUNDAS-GRANT said that the character of the ulceration and its situation recalled the self-inflicted injuries occasionally encountered during the war.

Mr C. A. PARKER (President) said that the ulceration had extended enormously since last Meeting, and the epiglottis was now considerably involved. It was an interesting case, and presented considerable difficulty from the diagnostic point of view.

Mr J. F. O'MALLEY asked whether the extension of the ulceration was spontaneous, or if it was a result of a portion having been removed for sectioning?

Mr BELL TAWSE (in reply) said that the ulceration on the pillar was spontaneous. The sectioned portion of the epiglottis and tonsil did not help the diagnosis. He believed it to be tubercular.

*2nd May 1923.*—The day after the meeting on 2nd December, the patient caught cold and became very ill, with a temperature of 104° F.: the palate was fiery red, yellow spots appeared on the swollen right tonsil, the sloughing area on the left pillar now involved the tonsil and extended rapidly upwards and to the middle line, affecting the uvula and much of the left palate. Ulcers appeared on the tongue, gums and lips coated with whitish deposit, the larynx was red and swollen, and some dyspnoea was present, relieved by inhalations. On the suggestion of Mr Mark Hovell, 5 c.c. colloidal argenticum were given hypodermically, a fall of the temperature to 102° F. followed, and the patient was more comfortable. Twenty-four hours later another 5 c.c. were given and the ulcers were freely painted with the same preparation, and the temperature fell to 99° F. Subsequent injections were given every four days until a crop of boils appeared, when they were discontinued. By this time the ulcers on the lips and tongue had healed and the swelling in the larynx had disappeared, but the ulcer on the left pillar and palate, though smaller in size and cleaner, remained much as before. The left tonsillar ulcer had healed and the epiglottis looked clean and healthy. On 1st January 1923, the temperature



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again rose to  $100^{\circ}$  F., and the patient developed an acute right follicular tonsillitis. Injections of 2 c.c. collosol argentum were resumed, and in forty-eight hours the temperature was normal. It rose again for twenty-four hours, then remained normal for six days. A further twenty-four hours' rise of temperature to  $100^{\circ}$  F. was followed by several weeks of normal temperature. Injections were discontinued on 20th January. As the ulcer on the left pillar and palate persisted—neither improving nor getting worse—he was sent to the Radium Institute for radium treatment. X-rays showed old, but quiescent, tubercular disease in the bronchial glands and lungs, and the opinion was held that the epiglottitis was tubercular. The patient was now sent into the country to live in the open air, to eat as much as he could, and to take cod-liver oil. In six weeks the ulcer had completely healed, and there was no active lesion in the mouth, pharynx, or larynx. The patient has remained well ever since. The diagnosis, therefore, remains undecided by all laboratory tests, but clinically, the case would appear to be one of tubercular ulceration of the left tonsil, palate, and epiglottitis.

## ABSTRACTS

### EAR

*A Critical Consideration of the Various Methods of X-ray Examination of the Temporal Bone.* GEORG VÖLGER. (*Acta Oto-laryngologica*, Vol. v., fasc. 1.)

This paper includes a somewhat detailed account of the history of the subject with descriptions, illustrated by photographs, of the various methods advocated by those who have developed the technique of radiography of the temporal bone. In comparing the relative advantages of the different directions in which the rays are made to pass through the bone, the writer suggests that the method to be selected depends, in any given case, upon the special points which require investigation; that no one direction of radiation is suitable for all purposes; and that it is usually well to employ several. This is the case even in radiography of the nasal accessory sinuses, in which the anatomical difficulties are much less formidable. He believes that, given a careful adaptation of the method to the case, and the requisite experience and skill in interpreting the skiagrams, radiography may be expected to yield as valuable results in diseases of the temporal bone as in those of other regions of the body.

The paper concludes with good reproductions of a number of interesting radiograms and references to seventy-four articles dealing with the subject.

THOMAS GUTHRIE.

*On the Arm Tonus Reaction.* E. WODAK (Prague), M. H. FISCHER (Prague). (*Zeitschrift für Hals, Nasen., etc.*, Bd. iii., p. 215.)

Fischer's reaction, the A.T.R. described by Wodak and Fischer (*Münch. Med. Woch.*, No. 6, 1922) is obtained experimentally when, with the eyes closed and the arms held straight out in front, one ear is subjected to cold irrigation. The arm of the same side sinks as if heavier, while that of the opposite rises as if lighter. With warm irrigation the opposite occurs. During rotation to the right, the left arm sinks, and on stoppage, the reverse. Galvanisation with the anode acts like cold irrigation, and with the cathode like warm. One degree centigrade above or below normal is said to be sufficient to induce the reaction. It is suggested that warm irrigation or cathodal galvanisation stimulates. (Cold or anodal inhibits.) Experimental weighing of the sunken arm shows an actual increase in weight (accompanied by a feeling of warmth) attributable to a change in the vascularity of the part through the action of the vaso-constrictor centres. The A.T.R.

## Ear

may occur spontaneously, independently of the labyrinth. Thus, in some diseases of the cerebellum, especially tumours, sinking of the one arm, along with loss of capacity for judging of weight, have been observed. This may in some cases be corrected by appropriate irrigation, *i.e.* warm on the dropping side. In other cases, such correction cannot be effected. Clinically, the spontaneous A.T.R. of the non-correctable type has been observed in cerebellar tumours or diseases causing pressure on the cerebellum. Spontaneous A.T.R. of both types has been found in other diseases of the central nervous system such as multiple sclerosis, as also in manifest peripheral affections of the vestibular nerve itself. Experimental A.T.R. is recommended as of value in clinical diagnosis.

JAMES DUNDAS-GRANT.

*The Behaviour of Psychical Traumatic Deafened Patients when tested with the Whispered Voice.* O. MUCK, Essen. (*Zeitschrift für Hals- Nasen- und Ohrenheilkunde*, Bd. ii., p. 255, 1922.)

The utmost distance at which the patient can hear the voice having been ascertained, numbers are whispered from just beyond that distance from two to four times, the same number at intervals of four or five seconds at the same distance. In the psychical cases it is found that the number is correctly repeated only after it has been given several times; on the other hand, in organic cases, as soon as the distance is short enough for the word to be heard, it is repeated at once but almost invariably incorrectly.

JAMES DUNDAS-GRANT.

*On the Diagnosis of Unilateral Deafness.* H. G. RUNGE, Jena. (*Zeitschrift für Hals- Nasen- und Ohrenheilkunde*, Bd. ii., p. 265, 1922.)

The difficulty of shutting out the hearing of the good ear is found practically insurmountable, and it is very easy to overlook the minor residua of hearing power in the deafened side. The noise machine of Bárány or the compressed air stream of Voss employed in the good ear, has a tendency to deafen still more the bad one; hence the risk of overlooking minute residua of hearing in the latter. When the good ear is one in which the radical operation has previously been performed, it appears to be impossible to shut out hearing even by means of the noise machine for the detection of the residua in the other ear. These conclusions were arrived at by the endeavour to exclude the hearing of both ears together by means of a deafening apparatus in each.

JAMES DUNDAS-GRANT.

## Abstracts

*Complete Traumatic Destruction of Vestibular Function with unusually Slight Coincident Cochlear Involvement.* Dr FIELDS. (*Laryngoscope*, vol. xxxiii., No 1, p. 16.)

The author states that it is now well established that lesions resulting from aerial concussion are rarely characterised by absolute and permanent deafness, and that there is only exceptionally an involvement of the vestibular apparatus, while lesions resulting from direct injury show, in addition to pronounced cochlear manifestations, a coincident affection of the vestibular structure.

The case described is one of direct injury which was followed by unconsciousness and later vertigo. On examination, a fortnight after the injury, the hearing was only slightly diminished and was of the inner ear type; a whisper could be heard at twelve feet. The rotation and caloric tests, however, elicited no response on the side of the injury. The author concludes that the static labyrinth took the brunt of the blow, while the cochlea escaped.

ANDREW CAMPBELL.

*Vestibular Investigations after the Removal of one Cerebral Hemisphere in the Rabbit.* DUSSER DE BARENNE, Utrecht, and A. DE KLEYN, Utrecht. (*Zeitschrift für Hals- Nasen- und Ohrenheilkunde*, Band iii., p. 197, 1922.)

After the removal of one hemisphere—say the right—the following observations were made:—

1. Simultaneous cold or warm irrigation of both ears produced no nystagmus (normal negative response).
2. The right-sided nystagmus following (1) rotation to the left, (2) cold irrigation of the left ear or (3) warm irrigation of the right is stronger than nystagmus induced by similar methods to the left.
3. In some of the rabbits in which the right labyrinth was also destroyed, nystagmus after rotation to the left was stronger than after rotation to the right, in spite of the loss of the right labyrinth. (This is the opposite of what takes place when the right labyrinth is extirpated without removal of the right hemisphere, showing the preponderating influence of the cerebral hemisphere.)

JAMES DUNDAS-GRANT.

*Is there a Fronto-pontile-cerebellar Path?* VOSS, Frankfurt-am-Main. (*Zeitschrift für Hals- Nasen- und Ohrenheilkunde*, Band iii., p. 191, 1922.)

The writer investigated a case in which a wound in the left frontal region involved the removal of a considerable area of the frontal bone. The most marked reaction was past-pointing with the right hand

# Larynx

outwards when the boneless area was cooled with chloride of ethyl. On the strength of these and other associated tests Voss sees no escape from the view that there is a fronto-pontile-cerebellar path.

JAMES DUNDAS-GRANT.

## LARYNX

*Cancer of the Larynx, Is it preceded by a recognisable Precancerous Condition?* CHEVALIER JACKSON, M.D. (*Annals of Surgery*, vol. lxxvii., p. 1., Jan. 1923.)

The author discusses at length various laryngeal conditions which he believes to be precancerous, defining the word as any histologically abnormal condition intervening between the normal and the cancerous. He lays stress on the view that repeated injury and long continued irritation and inflammation are potent causes of cancer. His views are illustrated by reports of four cases.

The following are his conclusions:—

1. From a clinical point of view we may regard continual laryngeal irritation from any cause, chronic laryngitis, keratosis, syphilis, pachydermia, so called prolapse of the ventricle and benign growths, occurring in a person of cancerous age, as clinically precancerous, in the sense that they may be contributory factors in the etiology of cancer.

2. It is no argument against this life-saving rule to contend that these conditions are too rarely predecessors of cancer to justify regarding them as etiological factors in cancer. There is no known agent causative of any disease that will always, in all individuals, under average conditions of exposure, produce that disease. The human race would be extinct if such were the case.

3. The time has come for the laryngologist to follow the lead of the general surgeon and the gynæcologist in the recognition of the necessity of curing cancer before its commencement.

4. There will be fewer deaths from laryngeal cancer when every member of the medical profession fully realises the frequently malignant nature of chronic hoarseness.

J. ARNOLD JONES.

*On the Question of Voice-building in Singers.* L. D. RABOTNOW, Moscow. (*Zeitschrift für Hals- Nasen- und Ohrenheilkunde*, Vol. ii., p. 322, 1923.)

Rabotnow dwells particularly on the necessity of good apposition of the vocal cords, in their cartilaginous as well as their membranous portions, for the prevention of the escape of air, which he considers to be the chief cause of vocal insufficiency. He reminds us again

## Abstracts

that old Italian singers were accustomed to hold a lighted candle before the mouth in order to demonstrate that while they were singing there was not sufficient escape of air to set the flame in motion. He considers that in defects of voice-production there is very frequently this gaping of the interarytenoid portion of the glottis, even when it cannot be seen by means of the laryngoscope. He resorts, therefore, to comparative anatomy, and tells us that in the mammals this opening is always present, hence possibly the unmusical nature of their voice. A certain amount of gaping is also seen in tracheotomised patients when the cords are inspected from below. By means of an appropriate face-piece and Marie tambour communicating with a revolving smoked cylinder, he finds that during the utterance of certain vowels, such as *U* and *i* (German), there is a greater escape of air than with other vowels, and he advises that in cases of vocal defect with escape of air (what we term "breathiness"), the singer should practise with this instrument and control his voice so as to have as little irregularity in the tracing as possible. He attaches importance to the action of the inferior constrictor of the pharynx, which is inserted into the posterior margins of the thyroid, and, by its contraction, pulls these together so as to assist in the closing of the glottis.

JAS. DUNDAS-GRANT.

*Laryngeal Paralysis associated with the Jugular Syndrome and other Syndromes.* GORDON B. NEW. (*The American Journ. Med. Sciences*, Vol. clxv., No. 5, May 1923.)

New mentions that Hughlings Jackson, in 1864, first described complete unilateral laryngeal paralysis associated with paralysis of the soft palate, tongue, trapezius, and sternocleidomastoid muscles.

Since the lesion occurs in the neighbourhood of the jugular foramen it has been called the jugular foramen Syndrome of Jackson. There is no mention, New says, of loss of taste on the posterior third of the tongue in Jackson's original description.

Mackenzie, in 1883, reported a similar group of paralyses associated with a syphilitic lesion of or near the medulla.

The Great War has accounted for many instances of the syndrome.

New records seven cases whose ages varied from 35 to 62 years. In all, except possibly one, the syndrome was due to neoplasm in the region of the jugular foramen involving the 9th, 10th, 11th, and 12th nerves. In four the tumour was of a low grade of malignancy, the duration of symptoms varied from two to twelve years. Of these four cases, one was a carcinoma of the mixed tumour variety—two were clinically mixed tumours of the parotid gland, and one a recurring basal-celled epithelioma of the right cheek.

## Miscellaneous

In two cases the pathological lesion was a rapidly-growing tumour, probably a lymphosarcoma, involving the structures around the jugular foramen.

In two cases, one due to basal-celled carcinoma and the other a rapidly-growing sarcoma, several other cranial nerves were involved.

The cervical sympathetic nerve was involved in four cases, as shown by myosis and narrowing of the palpebral fissure. It was noticed that hemiparesis of the tongue caused difficulty in swallowing fluids, whilst paralysis of the pharynx interfered with the swallowing of solids.

New points out that the syndrome due to involvement of the last four cranial nerves and the cervical sympathetic nerve in the region of the jugular foramen is quite unusual. It is usually due to the extension of a neoplasm, although a tuberculous process in the neck or an acute phlegmon may be the cause.

A good bibliography of the subject is appended.

F. HOLT DIGGLE.

### MISCELLANEOUS.

*The Effects of Antiseptics on the Bacterial Flora of the Upper Air Passages.* A. L. BLOOMFIELD. (*Bulletin of Johns Hopkins Hospital*, Feb. 1923.)

The treatment of "carriers" by vaccines has proved so disappointing that numerous attempts have been made to eliminate organisms from the nose and throat by local application of antiseptics, such as chloramine T, which was used in the British Army for treatment of meningococcus carriers. In order to determine the value of such antiseptic applications, the writer conducted a series of experiments on normal healthy subjects. Swabs were taken before and after the application, and quantitative and qualitative changes in the bacterial flora were noted. In no case was it possible to completely sterilise the experimental area, and it was apparent that, unless the entire mouth could be sterilised, conditions would promptly return to their previous state within a short time after the application.

Even such a drug as mercurochrome, which penetrates to such an extent that the mucous membrane retains the red colour for over twenty-four hours, produced no alteration in the bacterial flora.

Bloomfield suggests that it is possible that the beneficial effect of antiseptics is due to the irritation, hyperæmia, or ischæmia caused by the drug.

DOUGLAS GUTHRIE.

*Remarks on Boeck's Sarcoid, with Special Reference to its Occurrence on Mucous Membranes.* C. HVIDT. (*Acta-Otolaryngologica*, Vol. v., fasc. I.)

Since the dermatologist Boeck, in the year 1899, first described the disease known as Boeck's sarcoid or "benign military lupoid"

## Abstracts

nearly 100 cases have been reported; and, although a very pronounced and obstinate affection of the mucous membranes—especially the nasal mucous membrane—is present in more than 50 per cent. of the cases, the disease has received scarcely any attention from rhinolaryngologists.

The disease, which may develop primarily in the mucous membrane, presents itself either as a diffuse infiltration or as small or large nodules in the nose, mouth, pharynx, or larynx. The infiltrations are bolster-shaped, with rather uneven surfaces, brownish in colour, and of hard consistency, usually on the septum, the floor of the nasal cavities and the posterior wall of the pharynx. The nodules are miliary, yellowish-brown with narrow red margins, and appear either singly or in small groups whose centre is somewhat depressed. The consistency is almost as hard as cartilage, and it is characteristic that neither ulceration nor scar tissue is ever found. Subjective symptoms are slight and sometimes entirely absent.

The histological appearances of the disease in the skin, the lymphatic glands and the mucous membranes are essentially the same, and consist of clusters of epithelioid cells containing some giant cells without necrosis or local reaction.

The author describes a case observed by himself and discusses the nature and cause of the disease.

THOMAS GUTHRIE.

*Tracheotomy with the help of a Mandarin.* MM. HALPHEN and AUBIN. (*Archives Internationales de Laryngologie, etc.*, May 1923.)

The authors describe a technique advisable in certain cases calling for tracheotomy which, though propounded several years ago by Sebileau and Lemaitre, has not to their knowledge been described elsewhere.

The cases suited for this method are those of new growth of the thyroid gland or adjacent cervical region, in which the trachea has been subject, not only to compression and stenosis, but to actual displacement.

The "Mandarin" is an ordinary bronchoscopic tube which is passed through the larynx into the trachea under cocaine anæsthesia. It serves the double purpose of straightening and distending the collapsed walls of the trachea and also of providing a safe means of administering a general anæsthetic for the actual tracheotomy, which in such cases may be difficult, but which in the new conditions can be carried out in comfort.

After bleeding points have been secured, the trachea is incised and the bronchoscopic "Mandarin" withdrawn; dilators are inserted and the tracheotomy tube is placed in position.

J. B. CAVENAGH.



## REVIEWS OF BOOKS

*The Medical Annual: A Year-Book of Treatment and Practitioner's Index for 1923* (forty-first year). Pp. 600. Bristol: John Wright & Sons, Ltd. London: Simpkin, Marshall, Hamilton, Kent & Co., Ltd. Price 20s.

The *Medical Annual* for this year more than keeps up its reputation as continuation school and higher educator for the practitioner. The efficiency of the department of Nose, Throat, and Ear Surgery, as such, has been well maintained by Mr A. J. M. Wright, the sections on disease of the œsophagus being especially instructive. The side-lights thrown on our specialty from various quarters are particularly interesting. The tonsil comes in for an additional share of responsibility for the general ills that flesh is heir too. Thus, it is charged with causing hypothyroidism and the resultant changes in basal metabolism. Its criminality almost eclipses that of the teeth, of which rather less appears than in previous issues.

The participation of the tonsils in exciting diseases in other organs is increasingly illustrated. Reference is made to suppurative prostatitis, also to cases of double optic neuritis, paralysis of accommodation and papillitis due to tonsil disease and entirely relieved by removal of these bodies (pp. 170 and 172). The section on the after results of removal of tonsils is peculiarly encouraging, the results being most striking in cases with infection of tonsils rather than mere enlargement. The X-ray treatment is strongly advocated in some röntgenological journals (chiefly American) for hypertrophy of the tonsils, carcinoma of the thyroid, exophthalmic goitre, and diphtheria carriers (p. 386).

We can only say that for the general practitioner who desires to have things presented to him from the special point of view in one handy volume, this is pre-eminently the volume required. The same holds good most emphatically for the specialist who wishes to have them from the general point of view.

JAMES DUNDAS-GRANT.

*Endoscopie (Bronchoscopie, Laryngoscopie, Œsophagoscopie) et Chirurgie du Larynx.* Le Dr CHEVALIER JACKSON (F.A.C.S.), Traduit par Le Dr MENIER. Paris: Libraire, Octave Doin.

This is a very thorough French translation of Chevalier Jackson's *Peroral Endoscopy and Laryngeal Surgery*, with the exception of the chapter specially written by Professor Killian on "Suspension

## Reviews of Books

Laryngoscopy," which has been omitted. The illustrations are the same as in Chevalier Jackson's book. Unfortunately, Menier died at the age of 46, before completing the translation; but it has been finished and revised by Dr C. Chauveau. In a small leaflet enclosed in the book, Dr Chauveau pays a very touching tribute to Menier—a distinguished doctor, a capable practitioner in the specialty, and an excellent linguist who has translated many other works, Scandinavian, Dutch, and English, into French. The translation was interrupted by the war; it is perhaps unfortunate that it is only after the publication of a new edition of Chevalier Jackson's book that this now classical work has appeared in French.

G. EWART MARTIN.

*Die Therapie der Nasentuberkulose.* W. STUPKA. Leipzig :  
Kurt Kabitsch, 1922.

In this brochure the author gives a very full historical account of the various therapeutic measures which have been employed, from time to time, in the treatment of nasal tuberculosis. Detailed notes of twenty-five personal cases are given and discussed. These were treated in various ways with varying success.

He divides the disease into two forms, the ulcerating and the proliferating. The prognosis in the former is unfavourable as to life on account of the lung condition, while the latter is good. In ulcerating forms non-surgical treatment is indicated. Tuberculomas are best treated by radical operation aided by the use of selective remedies, such as X-rays, salts of the heavy metals, pyrogallie acid, lactic acid, or tuberculin. Infiltrating granulating forms are treated in the same way. Lupus is very difficult to cure completely, and selective remedies appear to give the best hope of cure.

J. K. MILNE DICKIE.

# LETTERS TO THE EDITORS

## NASO-PLASTIC INNOVATIONS

THE EDITORS,

*The Journal of Laryngology and Otology.*

SIRS,—In regard to Mr J. L. Aymard's letter published in your issue of May 1923, and his claim to the evolvement of the principle of the tubed pedicle, I cannot do better than quote a letter which I wrote to *The Lancet* of 7th August 1920, in reply to a previous communication from Mr Aymard on the subject.

TO THE EDITOR OF

*The Lancet.*

### THE TUBED PEDICLE IN PLASTIC SURGERY.

"SIR,—The operating books, surgical records, and ward sisters' report books of the Queen's Hospital show the following statement of fact. The first occasion on which the pedicles of a face flap were definitely tubed occurred at the first operation which I performed on A.B.V., the burnt seaman, the operation taking place on 3rd October 1917. The tubed pedicles progressed so well that the second stage operation, division of the pedicle towards its base for use on the face, was performed on 18th October 1917 (Mr. H. C. Mallison operating for me). Captain J. L. Aymard's case, B.C.H., was operated upon on 18th October 1917, when he designed an original flap for making the nose and at the same time 'tubed' it, in the same way as was done in my case. I am to blame in not informing Captain Aymard at the time he published his rhinoplasty case in your paper, that he was not the first to evolve the principle of 'tubing' the pedicle.—I am, Sir, yours faithfully,

H. D. GILLIES."

QUEEN'S HOSPITAL,  
SIDCUP, 3rd August 1920.

In regard to the method of inserting cartilage for depressed noses, my incision and method of inserting cartilage and support are original, but there are many other good ways of doing the operation.—I am, Sirs, yours faithfully,

H. D. GILLIES.

### THE USE OF COCAINE IN MUCILAGE OF TRAGACANTH.

TO THE EDITORS,

*The Journal of Laryngology and Otology.*

SIRS,—For some months I have been using cocaine dissolved in mucilage of tragacanth for operations on the nose. It has given so much satisfaction to myself, and to those who work with me, that I am induced to ask others to give it a trial. Used in 15 or 20 per cent. strength, with the addition of one quarter the amount of

## Letters to the Editors

adrenalin solution, it certainly produces better anæsthesia than we obtained formerly by packing the nose with wool or gauze soaked in a watery solution of the same strength. Fifteen minims of the mucilage solution with adrenalin added are sufficient to procure anæsthesia for the performance of submucous resection of the septum. The solution is smeared on the mucous membrane on which it forms a film. Maximum anæsthesia seems to be obtained in fifteen minutes. The ischæmia is as satisfactory as the anæsthesia. W. S. SYME.

GLASGOW.

### OPERATIVE PROCEDURES IN BILATERAL ABDUCTOR PARALYSIS.

TO THE EDITORS,

*The Journal of Laryngology and Otology.*

SIRS,—I enclose the copy of a letter which I forwarded to Mr Irwin Moore on the appearance of his paper on "Cordopexy," which was read on 2nd February at the Meeting of the Section of Laryngology of the Royal Society of Medicine.

All that I claim is that I was responsible for drawing Mr Trotter's attention to the hopeless condition of Abductor Paralysis while considering what operative procedure could be devised for its relief.—Yours etc.,

JAS. C. G. MACNAB, M.D., F.R.C.S.Ed.,  
*Honorary Surgeon Ear and Throat Department,*  
Johannesburg General Hospital.

DEAR MR IRWIN MOORE,—I was exceedingly interested in your paper *re* "Operative Procedures in Bilateral Abductor Paralysis," and the Discussion which followed it. Perhaps it would be of some interest to you to know that the operation you describe as suggested by Mr Trotter, and to which you have given the name "Cordopexy," was first discussed by Mr Trotter and myself during the summer of 1921; in fact, I have Mr Trotter's original drawing beside me. At the same time, we discussed Ankylosis of the Crico-Arytenoid Joint, and while Mr Trotter suggested the operation which you have now labelled Cordopexy, I suggested for the latter condition—first, a laryngo-fissure, and then the freeing of the Crico-Arytenoid Joint by means of a Jones' small tenotome; having divided the corresponding vocal cord for the greater part of its length, to insert it between the raw surfaces of the two cartilages, carefully suturing the mucous membrane and including the periphery of the now displaced cord—in other words, to treat the condition much in the same way as the bursa over a bunion is used between the raw bones to prevent them adhering, and to assist in the formation of a new joint.

You will see, therefore, that it was really as the outcome of my discussion with Mr Trotter that such an operative procedure was thought of.—Sincerely yours,

JAS. C. G. MACNAB.

## OBITUARY

HUGH CLAYTON FOX, M.R.C.S. (ENG.),  
F.R.C.S. (IRELAND)

Aurist and Laryngologist to the Marylebone General Dispensary ; late Assistant Surgeon to the Metropolitan Ear, Nose, and Throat Hospital, Fitzroy Square.

OTO-LARYNGOLOGISTS will learn with deep regret of the sudden and unexpected death on 13th June, from angina pectoris, of Mr Clayton Fox, at the age of 59, after only a few hours' illness. Up to the time of his death he was apparently in the best of health, and carrying on his strenuous work with the greatest vigour.

He was born, in 1864, at Coddendam, Suffolk, and was the eldest son of the late Frederick Fox, Esq., of Coddendam, Suffolk. Educated at Needham Grammar School, Clayton Fox studied medicine at the Middlesex and Charing Cross Hospitals, and ultimately in Dublin, taking the M.R.C.S. (Eng.) in 1888, and, in 1901, the Fellowship of the Royal College of Surgeons of Ireland.

After an experience of general practice in the North of London, he commenced the study of Oto-laryngology at the Central London Throat and Ear Hospital, Gray's Inn Road, and held the appointment of Clinical Assistant and Assistant Registrar. Later, he joined the staff of the Metropolitan Ear, Nose, and Throat Hospital, Fitzroy Square, first as Clinical Assistant and afterwards as Assistant Surgeon—an appointment which he held for seven years.

He generously devoted a great deal of his time as Chief Assistant, for many years, to the Throat Department, Brompton Consumption Hospital, and also as Registrar to the Aural Department of the West End Hospital for Nervous Diseases, Welbeck Street.

During the Great War he acted as Chief Assistant and Deputy at King George's Military Hospital, as well as at the Endsleigh and Vincent Square Hospitals for officers. He was appointed Aural Surgeon to the Ministry of Pensions, London District, and became attached to Queen Mary's, Duncane Road Military Hospital. He was constantly employed on Aural Pensions Boards, and during the past four and a half years he held three aural clinics a week at Hammersmith Broadway.

Two days before his death he was appointed Aurist and Laryngologist to the Marylebone General Dispensary.

Clayton Fox was a man of somewhat reserved nature, but he possessed a large and sympathetic heart, and those who had the opportunity of working with him, and knowing him, soon realised the sterling merits of his character and became greatly attached to him.

## Obituary

He was a student, in the best sense of the word, and a man of wide general knowledge; he accumulated an extensive library containing books upon almost every conceivable subject, including more particularly all the English and many foreign classics, and ranging down to the latest works on wireless telegraphy.

Sir James Dundas-Grant adds the following tribute to his memory:—

“Death has again visited our ranks and, as in several lamented instances, heart-failure has been the immediate cause. Mr Clayton Fox, who seemed a few days ago the embodiment of health and strength, died of angina pectoris after one day's illness. On the 18th June, in the presence of a small sorrowing party consisting chiefly of his widow, his family, and companions of his toil, he was laid to rest in the rural cemetery of Staines. Born and bred in the country, it was appropriate that his remains should repose away from the town where he had laboured too strenuously even for his splendid physical strength.

“As the result of his extensive reading, both in the specialty and in physiology, he was always armed with the latest views and greatly enjoyed discussing them. Indeed, he sometimes quoted them so emphatically as to surprise those who were not quite so well informed, and occasionally to ruffle some who were more sensitive as to their own dignity than grateful for fresh information. The writer acknowledges with gratitude the constant accession of information which he owes to him, as well as the unwearying help and support he has received from him in the execution of work which he could not possibly have carried out without his stalwart aid. During the War he worked with ardour and devotion in the Throat and Ear Departments of various military hospitals, and when Clinics for Pensioners suffering from deafness and diseases of the ear were instituted by the Ministry, several of them were entrusted to Mr Clayton Fox, who worked with herculean energy and made them an extraordinary success in circumstances which were sometimes difficult. Even in face of a large clinic he was able to carry out the details of scientific and practical otology with remarkable skill and acceptance. All those who have had the privilege of knowing him will certainly realise that they have lost a staunch, able, and never-failing fellow-worker.”

He wrote an admirable translation from the French of George Laurens' *Oto-Rhino-Laryngologie*, which, first published in 1919, has been in such great demand as to call for two new editions.

Clayton Fox leaves a widow, the only daughter of the late Louis F. Scott, Esq., of Wrexham, North Wales.

IRWIN MOORE.

# GENERAL NOTES

ROYAL SOCIETY OF MEDICINE,

1 Wimpole Street, London, W. 1.

*Section of Laryngology*—*President*, Mr H. J. Banks-Davis, M.B., F.R.C.P.—*Hon. Secretaries*, Mr J. F. O'Malley, F.R.C.S., and Mr E. D. D. Davis, F.R.C.S.

The first Meeting of the Section, Session 1923-24, will be held on Friday, 2nd November, at 4.45 P.M. Members who are desirous of showing patients or specimens should give notice of the same to the *Senior Hon. Secretary*, Mr J. F. O'Malley, 6 Upper Wimpole Street, London, W. 1, at least twelve days before the Meeting.

*Section of Otology*—*President*, Mr Sydney Scott, M.S. *Hon. Secretaries*, Mr Archer Ryland, F.R.C.S.(Ed.), and Mr T. H. Just, F.R.C.S.

The first Meeting of the Section, Session 1923-24, will be held on Saturday, 3rd November, at 10 A.M. Members who are desirous of showing patients or specimens should give notice of the same to the *Senior Hon. Secretary*, Mr Archer Ryland, 50 Harley Street, London, W. 1, at least twelve days before the date of the Meeting.

The attention of Members of the Section of Otology is drawn to the change in the dates of the Meetings of the Section during the ensuing Session. They will no longer be held, as formerly, on the third Friday of the month, but on the first Saturday of the month, concurrently with the Meetings of the Section of Laryngology. The hour of the Meeting has been fixed at 10 A.M.

A Conjoint Summer Meeting of the Sections of Laryngology and Otology will be held in London, on Friday and Saturday, 27th and 28th June 1924.

During the Session 1923-24, certain subjects of general interest have been selected for debate by the various Sections of the Royal Society of Medicine. On Friday, 7th December, at 8.30 P.M. the Sections of Anæsthetics, Laryngology, Otology, Odontology, Ophthalmology, and Surgery will discuss "The Comparative Value of Cocaine Substitutes."

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## THE SEMON LECTURE, 1923.

Dr A. Logan Turner, Edinburgh, has been invited by the Semon Lecture Board to give the Semon Lecture, University of London. The Address, entitled "The Advancement of Laryngology and Otology: A Plea for Adequate Training and Closer Co-operative Action," will be delivered in the Hall of the Royal Society of Medicine, on the afternoon of Thursday, 1st November, at 5 o'clock.

# General Notes

## THE JACKSONIAN PRIZE, 1924.

The Council of the Royal College of Surgeons of England has selected the following as the subject for the Jacksonian Prize Essay for 1924: "The Pathology, Diagnosis and Treatment of Oesophageal Obstruction."

Candidates must be Fellows or Members of the College, and not on the Council.

The Dissertations for the Prize for the year 1924 must be delivered at the College not later than 4 P.M., on Wednesday, 31st December of that year.

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## SECTION OF OTOTOLOGY—ROYAL SOCIETY OF MEDICINE; SUMMER MEETING, CAMBRIDGE, 29th and 30th June 1923.

The Summer Meeting of the Section of Otology of the Royal Society of Medicine was held at Cambridge on 29th and 30th June in Gonville and Caius College by the kind permission of the Master and Fellows. It had been decided that the work of the Section should be devoted to discussing the anatomy and physiology of the internal ear, and the success of the meeting was already assured when Dr de Kleyn of Utrecht accepted an invitation to give an account of the work on the functions of the Otolith apparatus which he has been doing in conjunction with Professor Magnus.

On Friday evening, after tea in Hall, Dr Albert Gray described his researches into the comparative anatomy of the labyrinth, and illustrated the story of its evolution by many admirable slides and diagrams of his celebrated specimens. Dr F. M. R. Walshe of University College Hospital gave an account of the studies of Sir Charles Sherrington on the tonic reflexes in the decerebrate animal and the latest applications of these reflexes to clinical medicine. Finally, Mr Hartridge of King's College, Cambridge, put forward an ingenious theory to explain the close connection between the vestibular apparatus and the cochlea, based on the analogy of the mechanism which regulates the depth at which a torpedo travels.

The Members of the Section afterwards dined in Hall with the Master, Sir Hugh Anderson. Sir Charles Ballance presided, and in proposing the Master's health thanked him, in a short but eloquent speech, for the magnificent hospitality extended to the Section. The rest of the evening was spent very pleasantly in the cool of the Master's garden.

On Saturday morning, Dr de Kleyn gave his address on the functions of the Otoliths. Speaking in English, he proved himself a complete master of his subject, and created a profound impression by his lucid exposition of this complex problem. Sir James Dundas-Grant opened the discussion, and was followed by Mr Sydney Scott, Mr Cheatle, Mr Jenkins, and Mr Tweedie. There was an excellent attendance of members from all parts of the country. The meeting will live long in the memory of those who were present on account of the importance and novelty of the subject, the erudition of the speakers, and the charming conditions under which it was held.

L. C.



# General Notes

BRITISH MEDICAL ASSOCIATION, PORTSMOUTH, 1923.

We desire to express our indebtedness to Dr Scott Stevenson for the following notes :—

The Annual Meeting of the British Medical Association proved highly successful, over a thousand members assembling from all parts of the world. Much of the success of such meetings, particularly on the social side, depends on the labours, over many months, of the local Honorary Secretary, and this year that hard-worked official was an aural surgeon, Mr C. A. Scott Ridout, who deserved and received many congratulations.

The Meetings of the Section of Laryngology and Otology, which were held over two days, were well attended, under the presidency of Mr E. B. Waggett, D.S.O. On the first day, a Discussion was held on "Internal Ear Deafness," which was opened by Dr Dan M'Kenzie, who touched on the difficulties of summing up the value of tuning-fork tests in deciding whether a condition arose from middle ear or inner ear deafness. Mixed deafness was, he said, the most common type of all, and the labyrinth affection might be merely functional. The prognosis of nerve deafness in middle ear disease was bad unless the middle ear disease could be arrested. He dealt seriatim with the relation between the vestibular reflexes and nerve deafness, vertigo and tinnitus, noise deafness and senile deafness, and concluded on a hopeful note. Mr W. M. Mollison divided deafness into qualitative and quantitative types; in the former, there was a loss either of the upper or lower tones, and, in the latter, there was an alteration throughout the entire scale. He dwelt upon the value of the monochord in diagnosing nerve deafness. Mr A. J. Wright said that those cases with an obvious cause, such as trauma and syphilis, presented no difficulty, and of the remainder, two-thirds were females. Sir James Dundas-Grant, Dr W. J. Leighton, and the President also spoke.

Mr E. D. D. Davis opened a short Discussion on the "Ophthalmic Complications of Sinus Affections," and said, that in 54 cases of retrobulbar neuritis he could prove in only 4 the existence of sinusitis. Sir St Clair Thomson condemned the tendency to operate on sinuses without evidence of disease, but Dr Ritchie Rodger and Mr Somerville Hastings stated that they had seen dramatic improvement after opening apparently healthy sinuses.

Mr H. D. Gillies read a paper on "The Treatment of Deformities of the Nose," illustrated by lantern slides. He pointed out that in deformity due to tertiary syphilis a two-stage operation was necessary, the first stage to restore the lining of the nose and the second, the cartilage.

On the following day, a Discussion took place on "Spasm of the Larynx," which was opened by Sir St Clair Thomson, who emphasised the importance of the psychological factor in intensifying and even in originating spasm. He quoted cases in adults due to gout, tabes, the morphine habit, and whooping-cough. He had found difficulty, on occasion, in distinguishing between abductor paralysis and adductor spasm, but he indicated clinical methods of solving the difficulty. Sir James Dundas-Grant drew a distinction between laryngismus stridulus and laryngitis stridulosa. He advised the treatment of the laryngeal crises of tabes by locally anæsthetising the larynx. Dr W. H. Kelson

## General Notes

pointed out that the ventricular bands formed a false glottis which sometimes became spasmodically closed. Mr William Hill, Dr Peter Macdonald, Mr A. J. Wright, Dr Dan M'Kenzie, Dr Davidson (of Queensland) Mr Somerville Hastings, Mr Mark Hovell, and the President also joined in the Discussion.

Dr W. J. Leighton read a paper on "Organotherapy in Diseases of the Ear, Nose, and Throat," and suggested that, in many conditions, organotherapy was a useful adjuvant to other treatment. Abnormally high blood pressure, the climacteric, hypothyroidism, and diabetes were all common causes of ear trouble, and were all amenable to organotherapy. Dr J. A. Gibb communicated a paper on "Referred Pain of Nasal Sinus Origin," and said that the site to which pain was referred was often largely disregarded. The position and the severity of the pain did not always depend on the severity of the sinusitis. Mr A. J. Wright, Mr Musgrave Woodman, and Mr T. B. Jobson discussed the paper. Mr V. E. Negus read a paper entitled "A New Function of the Vocal Cords"; he was of opinion that the vocal cords played an important part in fixing the thorax during independent use of the fore-limbs and supported his thesis by illustrations from comparative anatomy. Sir James Dundas-Grant communicated a paper on "Results of Canfield's Operation on the Antrum," giving his personal experience on the subject. Mr William Hill's paper dealt with "Butyn as a local anæsthetic in the Nose and Throat," and said that he had found it capable of replacing cocaine in some cases but not in all; on the whole, it was less reliable and it was two and a half times as expensive. Dr Eastman Sheehan, of New York Post-Graduate Hospital, gave a cinematographic demonstration of plastic operations upon the nose.

A feature of the Portsmouth Meeting was the number of entertainments and excursions; receptions were held on three nights, and a ball on another; on each day there were garden parties and visits to various naval establishments, and on Saturday there were no fewer than seven different excursions to various places of interest in the neighbourhood. The members of the Section of Laryngology and Otology were as prominent in these gatherings as elsewhere; indeed, one figure of note in the realm of laryngology made speeches not only at the Cripples' Hospital, but at the Temperance Breakfast.

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### DIPLOMA IN LARYNGOLOGY AND OTOTOLOGY.

For the information of our readers, we publish in full the text of the Regulations of the New Diploma in Laryngology and Otology (D.L.O.R.C.P. and S. Eng.) recently drawn up and issued by the Committee of Management of the Examining Board of the Royal College of Physicians of London, and the Royal College of Surgeons of England after conference with various teachers of the subject. The Regulations have been approved by both Colleges and have now come into effect.

It will be in the recollection of many that a movement in this direction was initiated, some time ago, by the Councils of the Sections of Laryngology and Otology of the Royal Society of Medicine, and it will be a matter of congratulation to the Members of both Councils that they now see their efforts rewarded.

# General Notes

## Regulations.

I. Both parts of the examination will be held in the months of June and December.

II. The examination shall comprise :—

Part I. (a) The anatomy, embryology, and physiology of the ear, nose, pharynx and larynx. (Candidates will be expected to be acquainted with the vascular, lymphatic, and nervous connections of these parts and with the central nervous system in so far as it relates to the special regions concerned.) (b) Elementary acoustics.

Part II. (a) The recognition and use of special instruments and appliances. (b) The medicine, surgery, and pathology of the ear, nose, pharynx and larynx.

III. The examination will be written, oral, and practical in Part I., and written, oral, practical, and clinical in Part II.

IV. Candidates may enter for Part I. of the examination at any time after a registrable qualification in medicine, surgery, and midwifery has been obtained. (Candidates must present themselves for the whole of Part I. In the event of failure in one division only, candidates will be allowed to present themselves for re-examination in that division.)

V. Candidates may enter for Part II. of the examination on the completion of one year of special study of diseases of the ear, nose, pharynx and larynx, after a registrable qualification in medicine, surgery and midwifery has been obtained, provided that Part I. has been previously passed, and on production of the following certificates :

(a) Of having attended the laryngological and aural clinical practice of a recognised hospital or of the laryngological and otological departments of a recognised general hospital for twelve months. (The conditions of this certificate (a) will be fulfilled by holding the appointment as house-surgeon or house-physician or as clinical assistant at one of the above hospitals or departments, provided that in the case of a clinical assistant the certificate shows that he has attended for at least three hours a day on two days of the week.)

(b) Of having attended operations to the satisfaction of the surgeons in charge.

(c) Of having received instruction in pathology and bacteriology with special reference to laryngological and otological medicine and surgery.

VI. The fee for admission or readmission to each part of the examination is £6 6s.

VII. Candidates must give fourteen days' notice in writing of their intention to present themselves for examination, to the Secretary at the Examination Hall, 8-11 Queen Square, Bloomsbury, London, W.C. 1. In the case of Part II. the necessary certificates of study must be produced with the notice.

VIII. Graduates in medicine or surgery of Indian, Colonial, and foreign universities recognised by the Examining Board in England, but whose degrees are not registrable in this country, may enter for the Examination for the Diploma in Laryngology and Otology on fulfilling the same conditions in regard to study.

## General Notes

IX. The above conditions of study may be modified at the discretion of the Committee of Management in the case of a candidate (*a*) who has carried out original investigations, or has written a thesis on some subject in laryngology or otology ; (*b*) whose studies have extended over a prolonged period of time without fulfilling the exact conditions ; but exemption will not be granted from any part of the Examination.

### *Syllabus of the Examination.*

*The Ear.*—Congenital deformities. Wounds and injuries. Foreign bodies and parasites. Acute and chronic inflammations and their complications. Oto-sclerosis ; tuberculosis ; syphilis. Simple and malignant new growths. Varieties of deafness, including deaf-mutism—vertigo—tinnitus. Tumours of the auditory nerve. Malingering.

*The Nose and Pharynx.*—Congenital deformities. Injuries and foreign bodies. Acute and chronic inflammation ; vasomotor rhinitis ; retro-pharyngeal abscess. Nasal obstruction ; adenoid growths. Acute and chronic inflammation of the nasal sinuses. Diseases of the tonsils. Tuberculosis ; syphilis. Simple and malignant new growths.

*The Larynx.*—Congenital deformities. Injuries and foreign bodies. Acute and chronic inflammation. Disorders of innervation, sensory and motor. Tuberculosis ; syphilis. Simple and malignant new growths.

*Note to Syllabus.*—Candidates will be examined on radiograms ; and also will be expected to recognise under the microscope and growing in or on nutrient media the organisms common to infections of the above regions.

For Part I. two examiners will be appointed by the Royal College of Surgeons ; for Part II. one examiner will be appointed by each College.

The Committee will, subject to an annual report to the Colleges, determine the courses to be specially recognised as fulfilling the conditions of the Regulations.

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At the recent Meeting of the American Medical Association held at San Francisco, the Section of Laryngology, Rhinology, and Otology, under the Presidency of Dr William B. Chamberlin, passed a resolution requesting the Board of Trustees of the Association to establish a monthly journal pertaining to the specialty of Laryngology and Otology.

At the same meeting the Report of the Committee on Lye Legislation was presented by Dr Wendell C. Phillips, and a number of members were added to the Committee on the recommendation of Dr Chevalier Jackson. The paper on "Lye Strictures of the Œsophagus" by Dr Richmond M'Kinney, in the current issue of the *Journal of Laryngology*, illustrates the necessity of legislation in connection with the sale of lye in the United States.

# The Journal of Laryngology and Otology

(Founded in 1887 by MORELL MACKENZIE and NORRIS WOLFENDEN)

## THE TREATMENT OF LARGE FOREIGN BODIES IMPACTED IN THE GULLET.\*

By D. R. PATERSON, M.D., Surgeon to Ear and Throat  
Department, Royal Infirmary, Cardiff.

THERE is perhaps no problem which gives to the endoscopist more concern than the difficulty in dealing with foreign bodies in the upper food passages. They arise, not infrequently, from the size or irregular form of the object, and it may not be inopportune, in the light of our growing experience, to pass shortly in review some of the aspects of the problem and to elicit the opinions of members as to the best way of dealing with them.

Large bodies are usually impacted in the upper segment of the gullet—that is, above the level of the suprasternal notch—being firmly held there by muscular action; more rarely, they are arrested about the hiatal opening. Besides being bulky, they may be jagged in form, with edges and points which impinge on the wall of the tube, and constitute a danger from penetration and infection of the surrounding tissues. It is this menace which demands prompt and efficient measures.

Among the commoner objects met with are dentures, pieces of bone, metal discs, pins of various forms, etc. Some, from their mere bulk, become firmly held up, and, if allowed to remain, soon become surrounded by swelling and œdema of the gullet wall, which adds greatly to the difficulty and danger of

\* Paper read at the Summer Meeting of the Section of Laryngology, Royal Society of Medicine, Manchester, 15th and 16th June 1923.

extraction. Even a large tooth-plate with a smooth surface may be so wedged in that it is hard to move, more especially if attempts have already been made with a bougie to push it down. It is, however, much more serious when, as is often the case, the body is provided with sharp angles and metal hooks which are apt to embed themselves in the mucosa and anchor it fast. A fractured denture of thin vulcanite is always a source of anxiety. But, perhaps even more dangerous, are large pieces of bone with sharp edges and irregular surfaces and crevices which harbour septic material—a factor which increases the risk of pressure ulceration. I have known a patient come into hospital suffering from purulent mediastinitis four days after swallowing a spicule of bone which had both ends pointed. Though it had not been interfered with, it was found at the post-mortem that one point had completely perforated the gullet, and the other nearly so. So, likewise, cracked dentures which have been worn for a time and are badly kept and dirty, are very prone to set up septic trouble. Safety-pins and pins mounted in various ways also present problems which may be difficult to solve.

It may be laid down as an axiom that before dealing with a foreign body, a careful survey of the case is absolutely necessary. The possession of a duplicate of the object is, of course, a real help. Radiograms made in different planes—antero-posterior, lateral and oblique—should be available, so that the exact presentation of the body may be made out and the problem of its extraction considered beforehand. Under general anæsthesia a careful inspection is made for the purpose of orientation. Tubes of various calibres should be made use of. The larger sizes give a wide access; with the smaller, close inspection of any particular part of the wall is possible, whilst the expanding tube is often of the greatest service. Attention should be directed to the situation of any sharp point. To protect this from injuring the soft parts during extraction, is the crux of the problem. It may be possible by seizing the point to rotate the body, especially if it is of no great bulk, so that the point may be brought into line with the long axis of the gullet and traction made without much fear of consequences. To parody a homely phrase, "Take care of the point and the body will take care of itself," applies to our problem. On the other hand, a large smooth body is often difficult to grasp, and here I have found a long-handled hook of practical value. Passed beyond the body, it may serve to loosen and rotate it. It is occasionally possible

## Large Foreign Bodies in the Gullet

to break up the impacted object and remove it piecemeal, a procedure, however, in which the utmost care must be exercised.

Early extraction hardly needs emphasising. It is of especial importance where the body is of jagged shape and has potential pressure points. Whilst, on the one hand, a smooth body may remain for a long period in the gullet without doing much harm, provided it permits food to pass, an irregular one, on the other hand, may rapidly set up septic trouble. One is often struck by the variability with which septic processes occur, perhaps to be explained by the circumstance that we have to deal with the presence of micro-organisms which differ in their nature and degree of virulence. One pointed body may lie *in situ* some days, with little or no local reaction around it; another may be accompanied, in a short time, with a characteristic fœtid odour which connotes ulceration. Thus, in the case of a soldier who swallowed a metal disc with a sharp edge and a diameter of half-a-crown, and who was seen on the sixth day after impaction, the odour was a warning to proceed with caution. A large size tube enabled the body to be carefully loosened and extracted from a deep ulcer on each side of the œsophagus, and the patient made a good recovery. On the other hand, a fractured vulcanite tooth-plate impacted in a young man produced in four days a distinct fœtid odour. This was seen to be due to an ulcer produced by the pressure of a sharp angle on the left side of the wall of the gullet. Nothing more than a cautious attempt to disengage it was made and it was considered advisable to do an external œsophagotomy. After exposing the gullet and feeling carefully for the foreign body, I felt the wall break under my finger like a piece of wet paper, and the point presented. Through this rent the broken plate was easily extracted and the patient ultimately did well. This was apparently an instance of deep ulceration quickly produced by a fractured surface already impregnated with septic material.

That the onset of septic infection may be a matter of hours, is illustrated by a case which came recently under my care. A mental hospital patient suffering from dementia paralytica swallowed his denture. The occurrence was not noticed until about six hours after, when he was observed to be unwell with a temperature of 102°. I saw him about ten hours after the event. A radiogram showed the plate with two sharp clasping hooks and serrated edge impacted partly in the hypopharynx and partly in the gullet. On examination the plate was seen

to be very firmly fixed by one of the hooks embedded in the lower part of the pyriform sinus, from which an area of œdema extended on to the side of the larynx. The hook was disengaged without difficulty and protected during the further manipulation which delivered the body. The patient succumbed a week later, and at the post-mortem a septic slough, giving practically a pure culture of streptococcus, was found in the pyriform sinus which the hook had penetrated, and this had given rise to aspiration pneumonia. The factor of sepsis may thus be a grave one and I have quoted these examples, which must have come within the experience of most, in order to emphasise its importance in deciding what form of treatment should be applied in such cases.

This brings me to the question as to what ought to be done when there is difficulty in extraction. Ought we to continue with our endoscopic procedures or do an external operation? Chevalier Jackson says that an external operation is unjustifiable until œsophagoscopy has failed in the hands of at least two skilful endoscopists. This is, I think, excellent advice, for every one would appreciate the assistance and support of an experienced colleague. It is however, I fear, a counsel of perfection for the majority who, not being in the happy position of having such valuable help at hand, have to shoulder the full responsibility. It is, therefore, necessary to arrive at some understanding as to what is the best procedure.

In the first place, external operation is practically limited to bodies in the upper segment of the gullet. I do not say entirely limited, for it is possible—and on this I would like to hear the experience of the members present—that extraction of a body lying below the suprasternal notch might be greatly facilitated by the closer access obtained through an œsophagotomy wound, in much the same way that a low bronchoscopy through a tracheotomy wound is sometimes an enormous advantage. I leave out of account the procedures designed to approach the œsophagus in its thoracic segment. I have seen only one such attempt and then it was impossible, on account of dense adhesions—the impaction of the denture was of some years' standing—to deliver the body, even after it was partially exposed.

Where perforation is suspected or actually present, an immediate external operation is, of course, indicated. The presence of septic conditions which may favour perforation does



## Large Foreign Bodies in the Gullet

not necessarily contra-indicate endoscopic manipulation, though it inculcates caution and imposes a limit as to what may be safely done. In such cases the advisability of œsophagotomy may well be borne in mind. It is said that the operation has a mortality ranging from 12 to 20 per cent., figures which are taken from the statistics of general surgeons. I have sometimes thought that the form of the neck may have an influence upon the mortality, a long thin neck lending itself to more ready access and better drainage than a short, thick muscular one. Since the introduction of endoscopy, the operation is not often done by laryngologists, but there are occasions when its performance is called for, and it is in the hope that this Meeting may lay down more definitely its indications that this short note is presented.

# A SHORT NOTE OF A CASE IN WHICH ENDOSCOPIC SEARCH FOR A FISH BONE IN THE GULLET WAS FOLLOWED BY CELLULITIS IN THE NECK, AND ABSCESS IN THE CHEST WALL.\*

By NEIL MACLAY, F.R.C.S. ED.

SOME of you may remember that at the December meeting of the Society, I mentioned a few details concerning a case in which endoscopic search for a fish bone was followed by cellulitis in the neck.

The present note deals with the same case, and completes the history.

A female, aged 25, consulted me on 15th November 1922, and complained of pain in the throat, particularly during deglutition, and said that she had swallowed a fish bone on the previous day. There was a tender spot on the right side of the neck about one inch below the cricoid cartilage, and swallowing, though painful, was by no means impossible.

Examination of the pharynx, so far as indirect vision extended, gave no clue to the cause of the symptoms and there was no obvious sepsis in the mouth, fauces, or nose. X-ray examination was not employed because, hitherto, no assistance had been obtained by such examination in the case of fish bones.

During the evening of 15th November, an endoscopic exploration of the gullet was carried out under general anæsthesia. As soon as the smallest-sized Irwin Moore tube passed beyond the cricoid constriction, the mucous membrane was seen to be altered. It was red and swollen and offered resistance to the passage of the tube. On the right side of the gullet, about  $1\frac{1}{2}$  in. below the cricoid, there appeared an irregularly oval area, bright red with a granular surface, which looked somewhat like the strawberry tongue of scarlet fever, and was inclined to bleed. The tube was passed about another half-inch without revealing any fish bone, and then withdrawn because the condition of the mucous membrane made further progress impossible without force.

Next day the patient was ill, complaining of great pain in the neck and acute tenderness on the right side just below the cricoid. Temperature and pulse were raised. In another twenty-four hours, cellulitis in the neck seemed to be an established fact.

\* Notes read at the Seventeenth Meeting of the Scottish Society of Otology and Laryngology, 9th June 1923.

## Cellulitis in the Neck

Four days after the examination, offensive taste and smell were complained of, and expectoration of foul smelling pus commenced. Gentle pressure on the right side of the neck caused pus to enter the throat and mouth. Rectal feeding was carried out and the lower end of the bed raised two feet. Bismuth was given by the mouth with a view to some local antiseptic action. On 23rd November, Mr R. J. Willan saw the patient and advised incision and drainage of the tender area of the neck. This was done on the evening of the 23rd.

The following is Mr Willan's statement of the case:—

"The point of maximum tenderness was between the cricoid and thyroid cartilages to the right of the middle line; there was no area of induration or special tenderness on the outer aspect of the root of the neck.

"In choice of approach certain points required serious consideration: (*a*) The shortest possible route in order to open up uninfected tissues as little as possible; (*b*) the establishment of good drainage; (*c*) the patient was acutely ill, with rapid pulse rate and elevated temperature.

"The focus could be drained either *in front* by dissecting down alongside the cricoid cartilage, or by dissecting inwards *from the side of the neck* behind the carotid sheath and its contents.

"The anterior approach was deliberately chosen, (1) because it was the point of maximum tenderness, therefore the nearest spot to the acute inflammatory area; (2) because I viewed with apprehension the idea of leaving any drainage tube, etc., behind the carotid artery for any long period; (3) the patient was desperately ill and the time taken by a long dissection would certainly have proved fatal. The operation proved a very easy one; a large collection of foul pus was located about one inch from the surface and alongside the cricoid cartilage. The cavity was drained by india-rubber tissue. Bipp was rubbed well into the walls of the dissected track up to the moment when pus was encountered."

In three or four days the temperature became normal and the condition generally showed improvement. The discharge from the neck was very free and very foul, but the expectoration of pus greatly diminished and the patient was allowed to swallow liquid food. The tissues of the neck became quite supple and the tenderness disappeared. At no time was there anything to suggest an extension of the inflammatory process

## Neil Maclay

down to the root of the neck. A septic sinus in the neck continued to discharge a lessening amount of pus and the patient's condition in all respects improved. Temperature and pulse were normal, and deglutition took place without apparent effort.

On 25th December, a complaint was made of pain in the chest at the level of the second rib on the right side. Nothing could be seen or felt and auscultation was negative. A few days after this, we noticed a swelling at the level of the second costal cartilage, which was hard and very tender. The swelling gradually increased though it never became more than an ill-defined bulging and never softened to the touch. Pain in the chest became very troublesome, was worse at night, and radiated into the arm and neck. In spite of those symptoms the patient's general condition was so much improved, that in response to many requests to be allowed out of bed, this permission was granted, and though discharge from the sinus persisted, it was greatly reduced; the pain in the chest became less, and the swelling much less tender.

On 11th January 1923, the temperature rose to 99.8, with alteration of pulse rate. The constitutional disturbance increased until the 15th January, when it was decided to explore the swelling on the chest wall.

Mr R. J. Willan performed the operation on 15th January 1923, and his account of the proceeding is as follows:—

“An abscess over the anterior end of the second intercostal space was incised. Dr Slade, bacteriologist, subsequently reported a double infection of Vincent's organism and streptococci. To obtain a satisfactory view, a vertical incision was made over the right sterno-clavicular joint connecting the neck sinus with the abscess cavity. It was found that the chest wall abscess communicated with an abscess in the superior mediastinum near the anterior end of the second intercostal space.

“A large curved probe was introduced into the mediastinum behind the sterno-clavicular joint, and it emerged from the original sinus in the middle of the neck. I hesitated at removing all the solid tissues in front of the probe on account of the serious risk of hæmorrhage; had one felt certain that a fish bone was lying there, this risk would have *had* to have been run. The whole area was thoroughly bipped and the skin sutured above the site of the chest wall abscess; drainage was

## Cellulitis in the Neck

arranged from the surface to the hole in the intercostal space. This track was purposely kept open for six weeks until it was certain that the mediastinal abscess had ceased to discharge; the wound then quickly healed."

Consideration of the etiology raises several important questions. (1) Did the patient swallow a fish bone? (2) Did the inflammation of the gullet begin without trauma? (3) Did the endoscopic manipulation cause the cellulitis in the neck?

I am disposed to think that a fish bone was swallowed and wounded an already infected and inflamed gullet, and that the endoscope perforated the gullet during the endeavour to reach the bone, which had no doubt passed on to the stomach. It seems probable that the Vincent organism may have produced ulceration and given rise to a pathological condition of the mucosa, prior to the date upon which the fish bone is said to have been swallowed, and that the streptococci completed the mischief after the trauma.

The behaviour of the pus in the mediastinum and the chest wall must be regarded as very unusual. The localisation of the infection in such an area and its progress towards the surface through an intercostal space is rather like the miraculous.

I am greatly indebted to Mr Willan for his kindness, and the skill and ingenuity which he displayed are worthy of all praise. When next confronted by a fish bone problem, I hope to be able to make use of the radiological advice given by Mr C. Thurston Holland, in the excellent contribution by Mr Thomas Guthrie, published in the May number of the *Journal of Laryngology and Otology*.

## DISEASES OF THE THYROID GLAND IN THEIR RELATION TO LARYNGOLOGY.\*

By F. HOLT DIGGLE, F.R.C.S. (Eng.), Manchester.

It is my intention to limit my remarks to the consideration of:—

- (1) The incidence of laryngeal paralysis in benign diseases of the thyroid gland, and
- (2) The effects of thyroid enlargements on the shape and position of the trachea.

Various estimates as to the incidence of pre-operative laryngeal palsies in cases of thyroid enlargements have been given.

Justin Waugh<sup>1</sup> found that, in a series of 185 cases, there was unilateral interference with laryngeal function in 27 or 14.6 per cent. Matthews reported 289 palsies in 1000 cases of goitre, 17 of which were bilateral, but it is not clear what proportion of these paralysees was pre-operative.

During the last eighteen months to two years, I have had the privilege of examining most of the thyroid cases occurring in Ancoats Hospital. My numbers are not large, but such as they are, they may be interesting. Out of 34 cases examined, 7 presented laryngeal or tracheal symptoms, a proportion of 20.6 per cent. This proportion is probably too high, and if it had been my privilege to examine a further series, probably a more reliable percentage would have been formed.

Of the 34 cases, 20 were simple parenchymatous goitres, 7 adeno-parenchymatous, 6 exophthalmic, and 2 cystic goitres.

I have not seen a case of laryngeal or tracheal involvement as the direct result of pressure in a case of exophthalmic goitre. This, I think, is what would be expected, for the thyroid in these cases rarely reaches any great dimensions. T. B. Layton, however, in 1921, showed to this Section a patient suffering from exophthalmic goitre who had bilateral abductor paralysis. No operation had been performed. I have, however, seen one case of functional aphonia, adductor paralysis, in the 6 cases of exophthalmic goitre examined. Excluding the above case of aphonia, of the six remaining cases of the series presenting laryngeal and tracheal manifestations, three were due to tracheal compression, one of which improved under medicinal treatment; one was due to the involvement of the right

\* Paper read at the Summer Meeting of the Section of Laryngology, Royal Society of Medicine, 15th June 1923.



FIG. 2.



FIG. 1.





# Diseases of the Thyroid Gland

recurrent laryngeal nerve in a periglandular inflammation due to hæmorrhage into a cystic thyroid. One was a woman of 43 years who had suffered from goitre for ten years. For the last twelve months she had been waking up in the night with attacks of suffocation. Nothing was revealed in the larynx or trachea, and I came to the conclusion that the attacks of suffocation were probably due to irritation of the recurrent nerve or nerves, as the heart was sound. Finally, there was one case of hoarseness in a female child aged 13, the subject of a diffuse parenchymatous goitre. The hoarseness had been in existence for six months, but, unfortunately, the case was lost sight of before an investigation could be completed. There was no laryngeal paralysis.

It will be seen, therefore, that of the 34 cases examined, only two presented paresis of the vocal cord, and of these one was a functional aphonia in a case of exophthalmic goitre.

**The Recurrent Laryngeal Nerve.**—Interference with the recurrent laryngeal nerve may be due to pressure, to stretching, or involvement in adhesions. In by far the majority of cases, the paralysis is unilateral and, as such, may easily escape detection without laryngoscopic examination, as there is practically no interference with the voice, beyond perhaps, some transient weakness and no respiratory embarrassment. Bilateral involvement is extremely rare. A case was reported to this Section by Beevor in 1921.

A study of the anatomical relations of the recurrent laryngeal nerve will show that, in its cervical portion, it is applied to the lateral wall of the trachea, and does not lie in the tracheo-oesophageal groove as is so commonly believed. Further, it will be realised that as regards its cervical portion, at any rate, it would be very unusual for the nerve to be implicated by pressure alone. A degree of pressure sufficient to involve the recurrent nerves would, in the majority of cases, soon induce respiratory distress from tracheal compression, which in itself would call for immediate attention before any vocal cord paresis could result.

The nerves, however, may be involved in other ways than by compression, namely, by stretching or involvement in inflammatory adhesions. An extension of the thyroid swelling towards the retro-tracheal, retro-pharyngeal, or retro-oesophageal spaces will tend to push the nerve with it, put it on the stretch, and so cause some paresis. An interesting case of this type is described by James Berry.<sup>2</sup>

## F. Holt Diggle

The patient was sent to him by Sir St Clair Thomson with paralysis of the right vocal cord. At the operation a large retro-pharyngeal extension was disclosed, and it is interesting to note that five months after the operation the vocal cord had completely recovered.

The retro-pharyngeal, or retro-œsophageal extensions sufficient to produce dysphagia, particularly if associated with recurrent laryngeal palsies, may occasionally, without further investigation, be mistaken for malignant disease of the œsophagus or mediastinum. The absence of any apparent external enlargement of the thyroid gland in these cases renders this mistake the easier. Kaufmann<sup>3</sup> describes such a case where the dysphagia was so great that an œsophagostomy was performed with, unfortunately, a fatal result.

By far the commonest type of goitre causing vocal cord paralysis is the intrathoracic variety. An extension of the thyroid downwards into the superior mediastinum can only be accommodated by displacement of the normal structures in this space, and amongst these the laryngeal nerve is included. The aorta may be displaced, and with it the recurrent laryngeal nerve, or the nerve may be stretched on the periphery of the tumour. It is noteworthy that in the recorded cases of vocal cord palsies associated with goitre, the left cord has suffered more frequently than the right. This is as one would expect, having regard to its anatomical relations.

The laryngeal nerve may be involved in the inflammatory adhesions of a perithyroiditis.

CASE I.—In 1921, I saw a lady, aged 60, complaining of some hoarseness, with pain in the right side of the neck and shoulder, and pain on swallowing, of two days' duration. There was a large tender swelling over the position of the right lobe of the thyroid gland, which did not move on swallowing. The carotid artery could be felt pulsating behind and to the inner side of the swelling. Examination of the larynx revealed an abductor paralysis of the right vocal cord. The swelling was stony hard, and appeared to be fixed on the larynx and trachea. At first it was thought to be malignant, in view of the recurrent nerve paralysis, but the pain and tenderness ruled this out of court, and the diagnosis of an intracystic hæmorrhage substituted. Operative interference was delayed. She was kept under observation; the tenderness and pain gradually subsided. Two months later, the paralysis of the right vocal cord had completely recovered, and the goitre was small, not tender or hard. She complained of only occasional pain on the right side of the neck.



FIG. 4.



FIG. 3.



# Diseases of the Thyroid Gland

It is evident, then, that the recurrent laryngeal nerves can be involved in cases of simple goitre, and too much reliance must not be placed on the fixation of a vocal cord in the diagnosis of the malignancy of a thyroid swelling.

An examination of the larynx in thyroid cases has, however, other advantages. It may enable the surgeon to decide which lobe to remove—the more prominent lobe is by no means in every case the offender—it may further warn him to exercise extreme caution, or to plan his operation so as to avoid injury to the, perhaps, one remaining functioning recurrent laryngeal nerve. Lastly, it may be of comfort to the surgeon to know that he has not been responsible for a vocal paresis revealed after operation. A closer co-operation between the laryngologist and general surgeon would, I feel, be of great benefit to both.

**The Trachea.**—Considering next the effects of thyroid enlargements on the trachea, we find that they are very much more common than interference with nerve function, and they are by far the commonest cause of respiratory distress. The trachea may be compressed or displaced in various directions according as to whether the goitre is unilateral, bilateral at the same level, or bilateral at different levels. Accompanying such compression there is frequently a rotation of the trachea on its vertical axis.

In the majority of cases, dyspnoea and stridor, due to thyroid enlargements, occur in subjects at or around puberty, and are associated with the parenchymatous type of goitre. The rapid increase in size of this variety of goitre which is so prone to occur at puberty, together with the softer and more yielding nature of the trachea in young people, renders dyspnoea and stridor a more frequent and urgent symptom than is the case with goitres occurring in older people.

Quite commonly, cases of respiratory distress in young people show very little, if any, visible external swelling of the thyroid gland, until a closer examination of the neck is made, and it is not uncommon for patients to be quite unaware of any increase in the size of the neck. A radiograph is of inestimable value in these cases, particularly if the picture be taken whilst the patient is making a prolonged deep inspiration.

The following cases illustrate some of the above-mentioned features.

CASE II.—In November 1922, a boy, aged 17, consulted me for difficulty in breathing of three months' duration. After riding his bicycle to work he had loud stridor, and had to rest for several

## F. Holt Diggle

minutes before beginning work. He had not noticed any increase in the size of his neck. On examination the larynx was normal, and at first no enlargement of the thyroid gland was noticed. A radiograph was taken (Fig. 1). It is seen that there is the usual bilateral, or scabbard compression of the trachea.

On re-examining the boy, I then noticed that there was a large diffuse swelling of the whole of the thyroid gland, which was particularly evident when the head was thrown back, or after exertion.

CASE III.—Another case occurred in a boy aged 15, who twelve months previously had had tonsils and adenoids removed for noisy breathing. The boy complained that he still had difficulty in respiration, and, after hurrying, made a croaking or crowing noise. He had a semi-cyanotic appearance. There was slight uniform enlargement of the thyroid gland, and the laryngoscopic appearance was normal. The boy had not noticed any increase in size of his neck. An X-ray photograph revealed a scabbard trachea (Fig. 2).

Both these cases were treated for a time with thyroid extract and iodine, but as no improvement developed, I decided to operate. In both cases the whole of the left lobe with the isthmus, and a portion of the right lobe were removed. An X-ray photograph was taken a few weeks after operation (Figs. 3 and 4). It is seen that the lumen of the trachea has widened out, but that there is some lateral displacement of the trachea from pressure of the remaining lobe.

This brings out the important point that it is essential in the majority of these cases to remove more than one lobe, otherwise one type of tracheal deformity is replaced by another.

I have had these cases under observation, and another X-ray photograph was taken six months after operation in order to note the further displacement, if any, of the trachea (Figs. 5 and 6).

It will be seen that the trachea is slightly more displaced, but there is no respiratory embarrassment in either case.

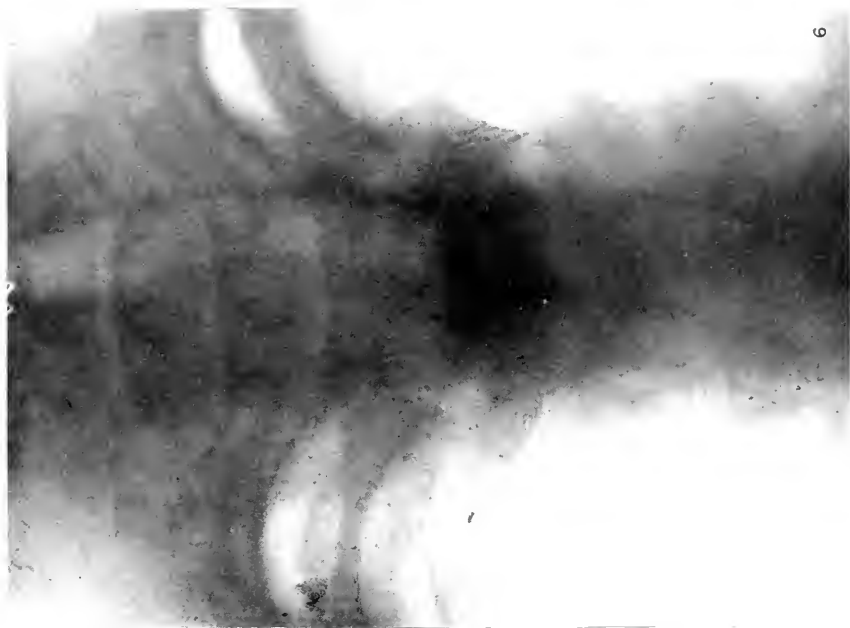
On another occasion, in view of the above tracheal displacement, I would be inclined to remove the outer halves or more of each lobe, together with the isthmus, leaving a portion of the postero-internal aspect of each lobe covering the recurrent laryngeal nerves.

Occasionally, the tracheal wall, as the result of long continued pressure, may so lose its natural elasticity as to collapse during forced inspiration or undue exertion. The exact pathology of this condition is still doubtful. Rose<sup>4</sup> of Zürich held that it was the result of atrophy and fatty degeneration, but subsequent



5

FIG. 5.



6

FIG. 6.





# Diseases of the Thyroid Gland

observers have failed to find any histological evidence of such atrophy or degeneration. Whatever may be the pathology of the condition, there is no doubt that in a few cases there is an actual thinning of the tracheal wall. Since the introduction of intratracheal anæsthesia, one can readily feel the intratracheal tube and occasionally grasp it between the fingers.

The tendency of the tracheal walls to collapse is a very troublesome complication. It can, of course, be relieved by tracheotomy, but one hesitates to do this when such a large space has been opened in the neck. A useful plan is to insert a couple of superficial mattress sutures in each lateral wall of the collapsed portion, and stitch them to the overlying sternomastoid muscles, or other available supporting structure. In older patients it is the substernal or intrathoracic goitre, particularly the adenomatous or cystic variety, which is so liable to cause dyspnoea from tracheal distortion.

These goitres may be downward prolongations from the cervical thyroid tissue, or may be totally separate from the normally situated thyroid gland, *i.e.*, developed from accessory thyroid tissue in the thorax. This variety of goitre is interesting, because it may be totally unsuspected and give no clue as to its existence from an examination of the neck alone. If associated with some degree of dysphagia and dilatation of the superficial veins of the thorax, as occasionally occurs, they may be set aside as cases of inoperable mediastinal tumours. The retro-sternal dullness on percussion with diminished air entry into the lungs, and other physical signs of tracheal or bronchial compression, will favour the diagnosis.

Apart from other methods of diagnosis, an X-ray photograph and fluoroscopic examination again come to our aid. The picture is frequently conclusive, in that displacement of the trachea can be readily identified.

My thanks are due to Dr Morison and the assistants in the X-ray Department of Ancoats Hospital for the excellent series of radiographs.

## REFERENCES.

- <sup>1</sup> *The Thyroid Gland* (George Crile), p. 59.
- <sup>2</sup> *Proc. Roy. Soc. Med.*, 1920-21, vol. xiv., Surg. Sect., p. 134.
- <sup>3</sup> *Deutsch. Klin. Jahrg.*, 1859, vol. xi., p. 59.
- <sup>4</sup> "Der Kropfto und die Radicular der Kropfes," *Arch. f. Klin. Chir.*, vol. xxii.

## CLINICAL RECORD

### A CASE OF HÆMANGIOMA OF THE RIGHT VOCAL CORD.

By J. ARNOLD JONES, Manchester.

In September 1922, a man, aged 45, consulted me in regard to his throat. His sole symptom was hoarseness of four months' duration. He was a foreman in a mill and had had a good deal of strain thrown on his voice.

On examination of his larynx a small purplish tumour, about the size of a small pea, was observed, apparently sessile, and attached to the free edge of the right vocal cord at the junction of the anterior and middle thirds. Both cords moved quite freely and no other abnormality was present. A provisional diagnosis of soft fibroma was made, and I decided to remove the tumour under local anæsthesia by the indirect method, as the man was very intelligent and showed his larynx well. This was done on the 2nd November. After one or two preliminary attempts, I obtained a firm hold of the tumour with Mackenzie's forceps and brought it away, a small tag of mucous membrane coming with it. Bleeding was negligible. Complete laryngeal rest was ordered.

I saw the patient at the end of a week. The voice was much improved but some hoarseness was still present. On examination a slight subglottic swelling was noticed on the right side, probably caused by removal of the tag of mucous membrane. Progress was uneventful and at the beginning of December the voice and larynx were normal. I sent the specimen for examination to Dr Loveday, who reported as follows:—

"The section shows the tumour to be covered by squamous epithelium, beneath which, thin-walled blood-vessels and blood-clot are seen. The tumour appears to be a hæmangioma with hæmorrhage, and there is no evidence of malignancy. A small tag of tissue which was folded on itself is attached to the tumour, and this gives rise to the appearance of epithelium on each side of it."

There are two points worthy of notice—

- (1) The almost entire absence of bleeding, and
- (2) The fact that the indirect method in an intelligent patient, who shows his larynx well and can co-operate with the surgeon, provides easier access to a tumour of this kind than does the direct.

A complete account of Hæmangiomata of the Larynx, by Dr Irwin Moore, will be found in the *Journal of Laryngology and Otology*, January and February 1921, and February 1923.

# SOCIETIES' PROCEEDINGS

## ROYAL SOCIETY OF MEDICINE—SECTION OF OTOTOLOGY

May 18, 1923.

*Chairman*—Sir CHARLES A. BALLANCE, K.C.M.G., M.S.,  
*Vice-President.*

**An Instrument for Assisting the Deaf**—W. M. MOLLISON, M.Ch. The instrument exhibited is known as the Marconi Otophone. It consists of electrical amplifying circuits in a polished cabinet to which are connected a sensitive microphone and a pair of head telephones.

By means of three switches the amount of current supplied to the valves can be regulated, and the degree of speech amplification can be adjusted to five different values.

The Marconi Company does not intend to market this instrument through the usual trade channels, but proposes to supply it only through the recommendation of the medical profession. A full description of it can be obtained from the Marconi Research Department.

Mr MOLLISON said that he had only had a week's experience of the instrument, but already he had found it useful in helping really deaf people to hear.

Sir CHARLES BALLANCE (Chairman) said that this was a remarkable instrument. In course of time it would no doubt be greatly improved; it would be a great advantage if outside noises could be suppressed. A great obstacle to its use at present was its weight (16 lb.).

Mr SOMERVILLE HASTINGS asked whether the instrument had been tried in the case of congenital deaf-mutes. When he (the speaker) heard the confusing extraneous sounds, he wondered whether it would be possible to attach a funnel to the microphone which could be directed towards the sound one desired to hear.

**Epidemic Cerebro-spinal Meningitis associated with Acute Suppuration of the Middle Ear**—FREDERICK SYDENHAM, F.R.C.S., and DAN M'KENZIE, M.D.—Girl, aged 16, was admitted to hospital in February 1922, under Mr Sydenham's care. She was semi-comatose and, to all appearance, totally deaf; the temperature was 103.5° F.: there was discharge from both ears with pain in both mastoids, and œdema on one side. The Heath operation was performed on each side. A little pus was found in the antrum, but nothing further, and not enough in Mr Sydenham's opinion to account for the grave

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symptoms. Both lateral sinuses were exposed and explored. The patient made a good recovery but remained deaf.

On 7th December 1922, she came under the care of Dr M'Kenzie, on account of the deafness. On examination she was found to hear all the tuning-forks, but only for a few seconds both by air and bone. A shout was heard as a loud noise only. The caloric tests were negative.

The case is reported as one of (probable) epidemic meningitis associated with suppuration of the middle ear, in order to draw attention to the possibility of the meningeal infection being due to that of the middle ear (see *Journal of Laryngology*, August 1922).

**Epileptiform Seizures subsequent to Operation for Temporo-sphenoidal Abscess**—DAN M'KENZIE, M.D.—Female, aged 35, was operated on for temporo-sphenoidal abscess six years ago, the pus being successfully evacuated through the antro-tympanic roof. The abscess was chronic, symptoms having existed for about six months, and the walls of the cavity were thick and tough. The first suspicious seizure occurred a year after the operation, and they are becoming more frequent as time goes on. They have never amounted to more than one in two or three months. The diagnosis of probable epilepsy has been made by Dr C. O. Hawthorne.

Sir CHARLES BALLANCE (Chairman) said that the second case seemed to be an unusual one, because the temporo-sphenoidal abscess was followed—a long time afterwards—by epilepsy; he (Sir Charles Ballance) did not remember that sequence in any of his own cases, though epilepsy following brain operations was not infrequent. In the first case, he supposed there must have been, as suggested, some meningitis in the posterior fossa, which involved the nerve, and, consequently, when the patient recovered, she was deaf. He remembered one case of pterygo-maxillary abscess in a case which was complicated by some intracranial infection; he believed it was lateral sinus infection. In his experience successive operations were always unsatisfactory, and often ended fatally. Whenever it was possible, all that was needed should be done at one operation. In this case the cavernous sinus was thrombosed, and there had been no attempt to deal with that infective process. He asked whether there had been a recent operation on infective cavernous thrombosis, and if so, what had been the result. Had any member had a successful operation recently?

Sir JAMES DUNDAS-GRANT asked whether, in the second case, there was any localising Jacksonian sign or any warning aura in connection with the epilepsy.

Mr E. MUSGRAVE WOODMAN said he had asked the patient whether she had any such warnings, and she had told him that she suddenly fell down wherever she happened to be. This seemed to him significant, and suggested that the condition might be hysterical. It would be interesting

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to hear from members their views as to what treatment, operative or non-operative, would suit such a case, especially if the seizures were caused by a brain scar.

Dr DAN M'KENZIE (in reply) said that he had since seen another case in a patient who had undergone an operation twenty years ago. There had first been a brain abscess, which was operated upon by Mr Marsh, of Birmingham; then a mastoid operation had been performed by Sir Charles Ballance. He (Dr M'Kenzie) had not been able to persuade the man to come to the meeting. The attacks seemed to be those of *petit mal* or automatism. He had never had regular epileptic convulsions. He (the speaker) did not know whether in the present patient it would be worth while to try and reopen the old area. Mr Tilley had told him of a case in his own practice of epilepsy following brain abscess in which operation had been successful, *i.e.*, there were no fits following it. The epilepsy in these cases might be idiopathic, and then operation would be useless. If the fits were due to a scar, conceivably operation would bring relief.

Sir CHARLES BALLANCE (Chairman) referred to a patient who, before suffering from a left temporo-sphenoidal abscess was very musical, but afterwards lost his musical sense, and was unable to play the piano. With regard to operation in cases of *petit mal*, or so-called idiopathic epilepsy, he (the Chairman) had seen many of these cases during and after the war; he thought the scars in the brain produced a definite vascular change in the cortex. When exposing the cortex, he had seen a blush come round the scar and the area then became white again. If the scar was adherent to the dura mater and the latter adherent to the bone, the normal excursions of the brain were prevented, and in such a case, he thought, some benefit would be produced by freeing the dura mater and thus allowing the brain to move freely again. In some cases in which he had carried out this plan the epilepsy had ceased, but he did not think he had done so after operations on brain abscess caused by ear disease. A drug which he had used in war cases with remarkable effect was luminal; if a patient takes this drug continuously in small doses the epilepsy may not return. To prevent the parts becoming adherent, Mr Sargent used celluloid, which served the purpose very well as, like pure platinum, it was not acted on by the tissues and fluids of the body.

**Otitic Pterygo-maxillary Abscess induced by Thrombophlebitis of the Jugular Bulb**—DAN M'KENZIE, M.D.—Boy, aged 8, was admitted with chronic suppuration of the left middle ear and a temperature of 102° F.; immediate radical mastoid; no relief to fever. Two days later wound reopened, and a small drop of pus on the floor of the external meatus was found to lead to an abscess in front of the bony meatus. This was opened and drained and a counter opening made into the pharynx. Lateral sinus was explored, but no clot found; no relief to fever. Two days later the internal jugular vein was exposed and resected and found thrombosed down to lower border of thyroid cartilage. Vein cleared

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of clot with curette as high as jugular bulb. Next day there were signs of cavernous sinus thrombosis, followed two days later by death.

*Post-mortem.*—Specimen shows erosion of outer wall of jugular bulb leading to the site of abscess in the pterygo-maxillary fossa, but no evidence of bone disease adjacent to the abscess.

This was evidently a case of thrombosis of the jugular bulb, which had extended down the vein into the neck, but not upwards into the lateral sinus. The thrombus in the bulb had broken down, and the pus had made its way through the wall of the bulb into the pterygo-maxillary fossa, tracking down towards the pharynx and back over the floor of the external meatus. This development is rare. Going over the literature of pterygo-maxillary abscess in 1915, the exhibitor could find only three cases in which the abscess was (doubtfully) traceable to thrombosis in the bulb.

**Brain Abscess due to Otitic Infection; Right Temporo-sphenoidal Abscess without Clinical Signs**—T. H. JUST, F.R.C.S.—Female, aged 27, had had otorrhœa and deafness on the right side since childhood. She had no other symptoms until a few days before admission, when she had had constant headache for three days, increasing in severity, and each morning she had vomited. On admission, she was able to walk slowly, but kept her head fixed, and there was some rigidity of the neck. The temperature was 101.2° F., pulse 120. The right tympanic membrane was obscured by epithelial debris, purulent discharge, and granulations. No abnormal signs were discovered during the examination of the central nervous system. The patient was right-handed. There was no amnesia.

The right mastoid was explored and the dura mater exposed. The mastoid was acellular, but the roof of the antrum was carious, and an extradural abscess was found immediately above the tegmen.

The dura mater beneath the temporo-sphenoidal lobe was covered with granulations; no pulsation of the brain could be felt; in the centre of the exposed dura mater a sinus was found leading into an abscess within the brain. This was opened up and drained by tubes, according to the procedure which Harvey Cushing suggested in the treatment of war wounds. With a No. 10 catheter the cavity was washed out with saline solution, and the material used in washing-out sucked out, the process being repeated several times in the effort to get away all the debris from the abscess cavity. The tube was kept in ten days; at the end of which time there was no pus coming from the abscess cavity, therefore the tube was removed. In a recent case in which the wound is not yet healed a similar technique was used. In this case there was 1½ oz. of offensive pus in the temporo-sphenoidal lobe: after removing the granulating dura which was covering the abscess, the cavity was washed and the fluid sucked out

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with a syringe for ten minutes, and a tube inserted; it was changed on the second day when no pus came out, but only a little straw-coloured fluid. On the third day the tube was removed. In war wounds of the brain it was found better to keep the track clean and not to use a tube, as the tube seemed to act as an irritant. Recovery was progressive and uneventful, and she left the hospital five weeks afterwards.

It is now nearly eighteen months since the operation, and nothing further has developed, though she occasionally attends the out-patient department complaining of vague "sensations down the right side of the body," regarded as "functional."

Mr G. J. JENKINS said that it was difficult to generalise, as no two cases of brain abscess followed the same course. In one of his own cases he had drained with corrugated rubber tissue; this tissue was much softer than a drainage tube, and as much or as little as required could be packed into the cavity. Sometimes a tube was rendered useless by becoming blocked. His (the speaker's) inclination was to make the drainage from the abscess cavity as free as possible, cutting away a good deal of the wall, according to the extent of the surrounding adhesions. The plan was likely to be much more effective than that of making a small hole and passing a tube through it.

Sir JAMES DUNDAS-GRANT asked whether there was any objection to exploring the abscess cavity with the protected little finger so as to ascertain whether the abscess wall was rigid, and whether there was, possibly, a second abscess feeling like an oyster through the wall. If the wall was not dense, the case would be suitable for removal of the tube, whereas if the wall was dense, it would be most unsuitable.

Sir CHARLES BALLANCE (Chairman) said that, except in a few cases, he had never dealt with a brain abscess without drainage, the exceptions being those cases in which he could enucleate the abscess. In his experience, a brain abscess was very difficult to drain. The liquid tissue of the brain was the difficulty. If the abscess had no wall, then as soon as pus came out, the brain flowed around and filled up the cavity. If one took out the drainage tube to see how the case was getting on, it might be very difficult to replace it accurately. His (the speaker's) best cases had been those in which he had inserted the drainage tube immediately after opening the abscess, and left it there. The suggestion to use rubber tissue might be a good one. It was difficult to wash out brain abscesses; their size was not known, so that sometimes the attempt to wash them out was dangerous as well as difficult. Moreover, sometimes a brain abscess had diverticula, and when the main abscess was drained, the pus in these diverticula was untouched. Brain abscess cases certainly required much caution in their management.

Mr JUST (in reply) said that he recognised the difficulties and limitations in dealing with brain abscess, but he thought what he had done was worth trying. The abscess was subacute and the walls were not very thick. He had used rubber tissue instead of a tube, and, on the whole, he preferred it.

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**Left Temporo-sphenoidal Abscess; Amnesia for Names of Objects**—**SYDNEY SCOTT, M.S.**—Female, aged 10, was said to have had deafness in the left ear for fully two years. She had been treated for otorrhœa until nine months ago, when the discharge ceased after removal of tonsils and adenoids. There had been no other symptoms until about a month before admission. She attended the out-patient department, complaining of pain in her left ear and some otorrhœa, but her condition was not regarded as serious until she had some kind of convulsion, followed by another two days later, and was then admitted as an emergency case. The convulsions were said to have involved the right side of the face and right upper and lower extremities.

On admission she was conscious; no hemiplegia. Temperature 101.6° F., pulse 96; tongue thickly furred; some pus and debris in left external auditory meatus; no mastoid signs, but slight tenderness on left side. The knee-jerks were unobtainable. The superficial abdominal reflexes were weakened on the right side. The child said she had no headache, but she liked to be left alone. On being questioned to test her memory for names of objects, she soon made repeated mistakes, became confused, and exclaimed she "could not be bothered to think." It seemed probable that the child had localised encephalitis of the left temporo-sphenoidal lobe. The antrum and aditus contained cholesteatoma and pus, and there was an extradural abscess in the middle cranial fossa, as in the preceding case. No pulsation of the exposed dura could be felt. When the dura mater was incised, unmistakable adhesions to the arachnoid and pia mater were found, extending to the lateral surface of the temporo-sphenoidal lobe. No pus escaped through the dura mater, though the incision was carried into the cortex, nor did the brain tissue protrude.

The child's general condition did not become quite satisfactory though neurological examinations revealed no fresh signs. She was allowed up and walked in the ward. The nurses said she seemed peevish and irritable and behaved like a spoilt child, and her mother said she was unlike her real self. In the third week she vomited unexpectedly two or three times. The "name amnesia" persisted, and it seemed justifiable to make a more determined exploration of the brain. On making an incision through the adherent membranes into the brain an abscess was at once found. This was drained with rubber tubes, and the child's condition, temperament, and memory rapidly improved forthwith.

It is now one and a quarter years since this operation, and the child is particularly bright and well, though the period of convalescence cannot be said to have been free from anxiety. Last summer she



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had more convulsions after a minor plastic operation, and terrifying dreams frequently disturbed her night after night. No further operation on the brain has been necessary. The operation cavity closed down and the meatus became stenosed. At present a post-auricular sinus persists. Attempts to re-establish a meatus and to close the sinus have been deferred until the child's condition justifies the procedure.

The observation of amnesia for names of objects, the occurrence of vomiting and absence of headache, were the leading clinical features of her case. The presence of the extradural abscess and of adhesions between the dura and the brain indicated the path of infection. Recovery was, no doubt, greatly favoured by the dural adhesions.

**Cerebellar Abscess; Sudden Coma and Apnoea; Recovery after Operation during Artificial Respiration** — SYDNEY SCOTT, M.S.—Male, aged 17, suffering from severe headache and chronic otorrhœa. Was admitted about 2 A.M., and in spite of his pain he could then walk and stand, and showed no discernible physical signs apart from discharge from the right ear. The house-surgeon withdrew some clear cerebro-spinal fluid, obviously under pressure, and arrangements were made to operate on the ear at 2 P.M. the same day. The patient became drowsy shortly before the time for operation, and had become quite unconscious when first seen in the operating theatre. Apart from confirming the evidence of middle ear suppuration, and finding that the patient's upper extremities remained elevated when raised and left free (cataleptic state), no other observations could be made. An anæsthetic was given, though this hardly seemed necessary, and the operation on the mastoid was begun, but before the antrum had been opened the patient had ceased to breathe. Artificial respiration was applied and the operation stopped, but breathing remained suspended while the dura mater of middle and posterior cranial fossæ was exposed. The tension of the dura mater was much higher in the posterior fossa, and no pulsation could be felt. No extradural abscess was seen. It was not possible, in the circumstances, to see if any path of infection could be followed up, and the dura mater was incised posteriorly to the sigmoid sinus by several radiating incisions through the dura mater covering the lateral and inferior surface of the cerebellum. Here no adhesions were encountered, the cerebellum prolapsed freely, expanding over the edges of the cut dura mater. In the cerebellum a large abscess was found, and on the escape of an ounce or two of pus spontaneous respiration was resumed. It was, however, necessary to apply artificial respiration for some little time, and the patient remained comatose for about two days, then he began to recover, and it was possible by the usual tests to recognise the signs of a cerebellar lesion, *e.g.*, coarse nystagmus to the side of the lesion—asynergia

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and the usual signs of inco-ordination in limbs on same side as the lesion.

When he left the hospital after three months he appeared to be perfectly well. The drainage in this case was *not* by the route of infection for reasons which are obvious.

**Cerebellar Abscess Five Weeks after Onset of Right Acute Otitis Media**—**SYDNEY SCOTT, M.S.**—Boy, aged 7, was admitted with otorrhœa and deafness on the right side. During the previous week drowsiness had been noticed and he had vomited a few times. On admission—temperature, 98° F.; pulse 130; nystagmus to the right; deviation to the right when pointing with right upper extremity: no asynergia, no dysdiadokokinesia, and finger-to-nose test was correct; reflexes normal, except doubtful plantar response.

Schwartz operation—very small extradural abscess found on mesial side of sigmoid sinus; exploration of cerebellum through this area, and about  $\frac{1}{4}$  oz. of pus evacuated; tube drainage.

The boy is progressing favourably.

These few cases of brain abscess are brought forward as examples, on the one hand, of the comparatively scant clinical evidence which would have justified a clinical diagnosis of abscess in each case, and, on the other hand, the fortuitous circumstances on which recovery depends. The cases do not comprise all met with during the last eighteen months, for some others which appeared as likely to recover have succumbed. Of the fatal cases, two cerebellar abscesses developed meningitis later, and in one case of temporo-sphenoidal abscess which had been diagnosed and drained within three weeks of the onset of acute otitis media, and had almost recovered, there developed a very slowly-spreading œdema of the brain, which terminated fatally about two months later. The autopsy in the last case proved that the abscess was efficiently drained, and there was no meningitis or intraventricular effusion, only œdema of the left cerebral hemisphere—a diffuse form of infective encephalitis.

Mr LAWSON WHALE asked whether Mr Scott considered that amnesia was still present. The girl, when a watch was shown to her, called it a clock; whereas any girl aged eleven might be expected to know the difference between a watch and a clock.

Mr G. J. JENKINS asked whether Mr Scott found "Cushing's defect" in the perimeter tracing in the first of these cases. He thought that for amnesia to be present the abscess would be further forward than in cases in which this defect was likely to be obtained.

Sir CHARLES BALLANCE (Chairman) said he thought that the presence of amnesia was a sufficient ground for diagnosis, and in this case Mr Scott had diagnosed the condition at once, and had been able to save the patient's

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life. A little before the war he (the speaker) had as patient an officer who had undergone a mastoid operation for long-continued otorrhœa. The nurse who was looking after him one day reported that he had forgotten her name; and when shown a watch he had been unable to name it. He (Sir Charles Ballance) had gently removed the tegmen and incised the dura mater above it. The dura mater was not pulsating, and was discoloured. There was no abscess, but the part of the brain above the tegmen was in a condition of encephalitis. Drainage through the dura mater was continued for ten days, and the patient had recovered. Shortly before his complete recovery he had been able to distinguish and name objects, and afterwards he had remained well.

Mr A. J. HUTCHISON remarked that the patient in the second case could use his hand well, except for buttoning and unbuttoning, and the disability in this respect was due to his having lost sensation in the tips of fingers and thumb.

Mr E. MUSGRAVE WOODMAN asked what would be the best method of draining cerebellar abscess in contradistinction to abscess of the temporo-sphenoidal lobe. If cerebellar abscess were approached from the aural region, pus welled up from the bottom, and everything looked satisfactory, but it was upward drainage, and in most of the cases which he had seen the patients died. In approaching the abscess from below, if there was a dural space which was not shut off by adhesions, there was a risk of infection and the production of meningitis.

Mr W. M. MOLLISON suggested that the numbness of the finger tips might be due to congestion of the cerebral cortex, in consequence of the temporary cessation of respiration.

Mr G. J. JENKINS, referring to the danger of meningitis in cases of abscess, said that recently, in two cases, he had put B.I.P. round the edges, getting between dura mater and brain. It was a special preparation of B.I.P., without paraffin, and the components sterilised separately. He thought it acted as a wall to prevent the extension of sepsis. He believed that the statistics of the results of treatment of brain abscess would give a gloomier picture than was generally thought.

Mr MUSGRAVE WOODMAN said he understood that at Queen Square Hospital intratracheal ether was being used as the anæsthetic in brain cases. At Birmingham they were using oxygen and chloroform intratracheally. With this method of anæsthesia it was not material if the patient voluntarily breathed.

Mr H. J. MARRIAGE said that he had once had to operate at a cottage hospital on a child, under artificial respiration, in a case of acute mastoid disease. It had been obvious that a brain abscess was also present, but there had been no localising symptoms to show where it was situated. Just after the administration of the anæsthetic had begun, the child ceased to breathe, and this circumstance pointed to the cerebellum as the site of the abscess. The Silvester method of inducing artificial respiration had been carried out for ten minutes, without any return of breathing, although the pulse had remained quite good. The assistant had then employed a modified Silvester's method, bringing the arms up to the level of the

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shoulder and then pressing them forcibly against the chest. While this was being done he (Mr Marriage) had trephined over the cerebellum. As soon as the trochar had been inserted pus had escaped, and the breathing had immediately recommenced. For the moment he (the speaker) had been satisfied with putting in a drainage tube and leaving it. Next day he had opened up the mastoid and found a track running beneath the lateral sinus into the abscess. He had put drainage tubes into both wounds, and for a week the child had done very well. Then it had suddenly rolled over and died. At post-mortem, not only a cerebellar abscess had been found but also a temporo-sphenoidal abscess, of which there had not been any symptoms.

Mr CLEMINSON said that he had had an opposite experience in connection with cerebellar abscess (in a girl aged 15). While the pus was draining out, the patient had stopped breathing, and though artificial respiration had been carried on for six hours, she had never breathed again. At that time there had been no intratracheal apparatus in the hospital for the administration of the anæsthetic, but he felt that if a tube could have been introduced through the larynx and air insufflated, possibly the œdema which caused pressure on the edge of the foramen magnum might have subsided. If he had to operate again in a case of cerebellar abscess he would have an intratracheal anæsthetic, because the tube could be left in position, and air could be blown into the lungs indefinitely.

Sir CHARLES BALLANCE (Chairman) said that in his experience as soon as the dura mater was opened respiration was resumed. In one case he had had, artificial respiration had been carried on for five hours; he (Sir Charles Ballance) had performed craniectomy, and as soon as the dura mater had been opened, the patient had begun to breathe again. This had also been the case during his operations on cerebellar tumours and abscesses, breathing had begun again as soon as pressure had been removed from the medulla. In the cases with which he had had to deal, the Silvester method of artificial respiration had been employed. The most important point was that of the prevention of meningitis in cases of brain abscess in which there was no matting of meninges. That was a problem which, he thought, had not yet been solved. Some members had suggested putting various materials underneath the dura mater before opening the abscess; but it was not easy—owing to the pressure—to introduce anything between the dura mater and the arachnoid, before opening the abscess, and even if that was done, the subarachnoid space was not shut off. He (the speaker) had tried putting pieces of gauze which had been soaked in some solution between the dura mater and the arachnoid, simply closing the subdural space in that way, or putting in B.I.P. But that was not all that was necessary; the subarachnoid space must also be closed, for it was in that space that one desired to avoid the possibility of meningitis. In some cases, when he had opened the brain abscess, he had been able to prevent the extension of infection to the subarachnoid space through healthy brain tissue without matting of the meninges. If this problem could be solved the lives of the patients in these cases could be saved. Then we should not have to search for the pathological track through which the infection had entered the cranial cavity.

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Mr SYDNEY SCOTT (in reply) said that artificial respiration had been performed by the anæsthetist Dr R. Wade, and the house surgeon, Mr Prance, the sister of the ward acting as chief assistant while he exposed and opened the cerebellum.

**Case of Vertigo cured by Opening the External Semicircular Canal**—W. M. MOLLISON, M.Ch.—Male, aged 42, was seen in September 1922; for two months he had suffered from giddiness and tinnitus in the left ear. The giddiness came on suddenly while he was driving a van, objects rushed to the left and he “felt queer”; the attack gradually passed off. The attacks recurred, sometimes he had as many as three a day; on one occasion he fell in the fire and burnt himself severely. Examination of the ears showed normal membranes. Hearing in the right ear was good, in the left ear almost absent.

No spontaneous nystagmus was seen. Caloric response on both sides was sluggish; indeed it was doubtful whether any response was obtained on the left side. Past pointing normal on the good side (right) and absent on the deaf side. Dr Symonds examined the patient and found no sign of intracranial lesion. It was decided to open the left external semicircular canal. This was done in January 1923. Within four weeks of the operation the patient was entirely free from vertigo and could hear a whisper at a distance of 8 ft. from the left ear. To-day he is deaf in the affected ear.

Dr DAN M'KENZIE asked whether Mr Mollison could say what the lesion might have been. He (Dr M'Kenzie) remembered the suggestion that in some cases of vertigo there was a state similar to that in the eyeball in cases of glaucoma; that is to say, the condition was due to pressure. He thought this theory would explain the symptoms in the present case; first the attacks of deafness, secondly the relief following the opening of the external canal.

Dr KELSON said that, in 1913, he had had a similar case. The patient, a house-painter, had been so giddy that he could not go up a ladder in the course of his work. He (Dr Kelson) had operated on the right external semicircular canal in a similar way to that described, and had shown the patient, in 1914, at a meeting of the Section. At that date he had practically lost the giddiness and the tinnitus. Since half the benefit from recording such cases was lost if they were not followed up, he (Dr Kelson) had written to the patient's doctor who had reported, in 1916, that the man was well, could again climb ladders and do his work and no longer had tinnitus. In 1921, eight years after operation, the report was that the man had kept well until the previous September, when he had again begun to have attacks of giddiness and some degree of tinnitus.

Mr ARCHER RYLAND said Mr Mollison had certainly achieved a good result in this case, for not only had there been a total abolition of the vertigo, but the hearing had very substantially improved. He (Mr Ryland) did not know if Mr Mollison would strongly advocate this operation for

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the relief of vertigo. He (the speaker) would feel very hesitant about opening the external semicircular canal for that purpose. He had on one occasion opened this canal inadvertently in the course of an ordinary radical mastoid operation, and a prolonged and troublesome vertigo had resulted.

Sir JAMES DUNDAS-GRANT said he supposed the idea was that in this case there had been an increased tension in the fluids of the internal ear. He asked what had been the steps in the operation. The middle ear had been preserved intact. He (Sir James Dundas-Grant) suggested that if the operation on the external semicircular canal was to entail loss of hearing, it would be safer, and to many easier, to remove the tympanic membrane and ossicles completely, thereby allowing more room for the expansion of the internal liquids through the freer play of the annular ligament in the fenestra ovalis. The greater play might suffice to relieve the pressure.

Mr LAWSON WHALE said that he had done this operation deliberately in two cases. He had to do the radical mastoid operation first, otherwise he would not have obtained access to the horizontal canal. He made a  $\frac{1}{4}$  in. opening immediately above and parallel to the horizontal part of the facial canal, and he would like to hear how large an opening Mr Mollison had made, and how much exposure of the semicircular canal he had secured. He would also like to know how long after the operation compensation for the loss of labyrinthine function had occurred. In his own cases the patients had been giddy for three weeks, and had then recovered.

Mr MOLLISON (in reply) said that beyond accepting the suggestion that these cases might be compared to those of glaucoma, he had no theories. He approached such cases, from an operative point of view, with considerable hesitation. In the cases (4 in number) in which he had operated, the hearing in the affected ear had been much diminished; in two it had been practically absent. Three of the patients had been taken into hospital and carefully examined by physicians before it had been decided to operate. In two of the cases he had operated at the request of the physician, as the patients' lives were a burden as a result of vertigo. In one case, that of a clergyman, there was some pressure on the part; the second case was the one shown to-day. In the third case the patient was a publican whose vertigo had been so severe that he had had to give up all his work. The fourth case was that of a private patient, who had consulted Dr Hurst. He (Mr Mollison) had found the operation so easy that he feared he might be tempted to perform it without due consideration. He opened the mastoid exactly as for ordinary mastoidotomy, exposing the aditus region as fully as for a mastoid, so as to get a good view of the external semicircular canal; he then chipped open the canal. He had not formed a conclusion as to the best course to pursue after that. In the first case, remembering Mr Sydney Scott's experiments on pigeons, he had injected absolute alcohol into the canal, in order to destroy the function of the labyrinth. The result had been fortunate; it was more than two years ago since the operation, and the patient had resumed work and had had no more vertigo. In the second case alcohol had not been injected, and all vertigo had ceased. In the third case pure carbolic

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acid had been applied, and the attacks had ceased absolutely. The fourth case was so recent that the result was not yet known. The operative treatment of cases of non-suppurative labyrinthine vertigo had been suggested many years ago by Mr Cheate, and carried out by Mr Lake, Mr Jenkins, Mr Hugh E. Jones, Mr Sydney Scott, and others.

The difficulty consisted in selecting cases in which operation was indicated, and in excluding extra-labyrinthine causes for the vertigo.

**Sequestra removed from the Region of the Eustachian Tube during a Radical Mastoid Operation**—T. H. JUST, F.R.C.S.—Female, aged 23, had suffered from suppuration in the right ear since childhood. For six weeks before being seen by exhibitor she had had a right-side facial palsy. She died suddenly five days after a radical mastoid operation. An autopsy showed extensive osteitis, practically the whole of the petrous portion of the temporal bone being involved.

**Section of Ependymal Glioma growing from the Floor of the Fourth Ventricle, simulating a Cerebellar Abscess, in a case of Bilateral Chronic Suppurative Otitis Media**—T. H. JUST, F.R.C.S.—Male, aged 26, complained of double otorrhœa of long standing, and of symptoms indicating that the left cerebellar fossa was involved. On exploration, the cerebellum bulged under pressure, but no abscess was found. The patient became worse, and a more thorough exploration was made, but the result was negative. The patient suddenly died of respiratory failure two days later. On post-mortem, an ependymal glioma was discovered, arising from the floor of the fourth ventricle. The tumour would have been absolutely irremovable.

## THE SCOTTISH SOCIETY OF OTOLOGY AND LARYNGOLOGY

SEVENTEENTH MEETING, HELD IN THE ROYAL  
INFIRMARY, EDINBURGH

June 9, 1923

*President*—Dr R. P. MATHERS.

**A Case of Adeno-Carcinoma of the Kidney with Secondary Metastatic Growth in the Larynx**—Dr A. LOGAN TURNER.—(The case will be published *in extenso* in the *Journal of Laryngology*.)—Male, aged 70, suffering from hoarseness for three months, was seen in January 1922. The mobility of the right vocal cord was impaired by a smooth, pale, non-ulcerated sub-glottic swelling. The rest of the larynx appeared normal. A firm, painless swelling, the size of

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a small orange, involved the left deltoid muscle. A section made from the latter revealed a tumour, the structure of which resembled a hypernephroma. The laryngeal tumour was regarded as being a similar metastatic growth.

Post-mortem examination, in August 1922, disclosed the primary tumour in the right kidney.

Dr ALEXANDER said he had nothing to add except from the point of view of the pathology of hypernephroma. Most authorities believe that suprarenal "rests" do occur in kidneys, and, from such "rests," tumours may develop which are called hypernephromata; it is recognised now that many primary renal neoplasms, which have been regarded as arising from suprarenal inclusions, are, in reality, adeno-carcinomata of the kidney itself, which have acquired a superficial resemblance to suprarenal cortex from their very complex papillary structure. In the case under discussion, parts of the primary tumour showed definitely that the condition was really a papillary adeno-carcinoma of the kidney, whereas the deltoid metastasis was not unlike the zona fasciculata of the suprarenal cortex.

Dr GRAY desired to ask Dr Alexander with regard to the spread of cancer. Dr Sampson Handley of London held the opinion that cancer never spreads by the blood-vessels, but always by the lymphatics. He (the speaker) did not altogether agree; and in this case the tumour appeared certainly to have spread by the blood-vessels.

Dr ALEXANDER replied that Dr Sampson Handley's belief that cancer spread, in the vast majority of cases, by permeation of lymphatic channels was now, he thought, universally accepted, but that cancer also disseminates, not infrequently, by the blood-stream could not be doubted at all.

### **Cases of Lupus and Malignant Disease of the Fauces and Pharynx treated with Diathermy—Dr A. LOGAN TURNER.**

Dr W. S. SYME said that the problem of these cases was becoming almost an economic one. He had, at the present time, five in his wards, all requiring a great deal of the nursing staff's attention in keeping them clean. When the slough commenced to separate, the mouth must be kept clean by swabbing with  $H_2O_2$ , and it meant a great tax upon the nursing staff. He thought that diathermy was a tremendous aid in the treatment of these cases, whether operable by the knife or regarded as inoperable. He showed a case to the Society in December. It was sent as inoperable, with a very large mass in the palate, side of the fauces and tongue, and extending into the pharynx, with a mass of glands in the neck. A year previously, he had removed the growth completely by diathermy, leaving the glands in the neck. The patient remained without any recurrence, but the interesting point about him was in the change that took place in the glands. He had left the glands in the neck at the time, but removed them, several months after, from the anterior triangle. They had gone down very much, and one hard gland about the size of his thumb remained. He removed it, and found that it had undergone changes which seemed to be towards cure. The mass had been converted into very firm fibrous tissue in which were a few islets of malignant tissue. Was it possible that in the



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process of coagulation of the tissue in these cases, there was some chemical change by which something was formed that had an effect on cancer cells carried to a distance? It was not the action of the heat, because the glands were at a distance. In treating an intralaryngeal condition, such as lupus, by this method, he thought it safer to perform a preliminary tracheotomy.

Dr MATHERS asked if the tubercular cases thus treated were of the nature of lupus. He had treated two cases of lupus of the soft palate with, so far, excellent results—better than he had ever seen with acid nitrate of mercury or anything else.

Dr LOGAN TURNER said that he had been treating lupus by diathermy, and where the nasal and pharyngeal condition had been combined with lupus of the larynx, tuberculin had been used. The danger in operating upon the larynx lay in the production of stenosis.

**Case of Temporo-Sphenoidal Abscess**—Drs A. LOGAN TURNER and G. EWART MARTIN.—Male, aged 46, a case of left-sided temporo-sphenoidal abscess, was operated on in 1920 by Dr Turner. He developed signs of intracranial pressure with Jacksonian fits two years later. A decompression operation with separation of adhesions over the old affected area was performed in January 1923 by Dr Martin. No intracranial symptoms had developed since, and improvement in memory had taken place.

**Two Cases of Left Temporo-Sphenoidal Abscess in Females, aged respectively 13 and 15: Operation: Recovery**—Dr J. D. LITHGOW.

**Left Temporo-Sphenoidal Abscess following Chronic Suppuration: Operation: Recovery**—Dr W. T. GARDINER.—Male, aged 16, had headache and vomiting for two weeks. He became comatose on the fifteenth day, and was sent into hospital as an encephalitis lethargica. On examination he could not be roused. The left pupil was larger than the right. Both meatuses contained foul-smelling pus. It was ascertained from the relatives that there had been an attack of pain in the left ear two weeks previously. At operation (2/4/23) 1½ ounces of foul pus were evacuated. On one occasion, four days after operation, there was slight drowsiness and aphasia owing to re-collection of pus. Further course was uneventful.

**Right Temporo-Sphenoidal Abscess following Chronic Suppuration: Operation: Recovery**—Dr W. T. GARDINER.—Female, aged 16, for sixteen days previous to admission had pain in the right ear with intermittent vomiting of the projectile type. She had had a radical operation on the left ear in 1920. Oculist

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reported double optic neuritis of some considerable standing. Operation on right ear: lateral sinus far forward; tegmen antri removed and small extradural collection of pus was found. Dura mater was covered with granulations to the extent of a shilling-piece. Bone removed and dura mater incised to extent of one inch. Dressing forceps passed into brain in an upward and forward direction without result: finally in a backward direction, when a large quantity of very foul-smelling pus was evacuated to the amount of about two ounces. After treatment gave considerable trouble with drainage, but eventually dressing twice daily proved successful.

Dr LOGAN TURNER said that it would be interesting to learn from observations upon a large series of cases operated upon for temporo-sphenoidal abscess, as to the proportion of cases which suffered from Jacksonian fits.

Dr GRAY wished to ask Drs Turner and Martin, with regard to the loss of memory in their case, if any distinction had been made as to the kind of loss of memory.

Dr DOUGLAS GUTHRIE inquired if the reporters of those interesting cases had any experience of the method of dealing with cerebral abscess as suggested by Lemaître. The latter introduced at first a fine capillary tube, and then used a larger tube at each dressing until free drainage was secured. By this means he claims to eliminate the dangers of meningitis and cerebral hernia.

Dr MARTIN (in reply to Dr Gray) said it was a case of loss of word memory. Drainage had been the difficulty in every one of his cases of brain abscess, and he found that if the means used were changed from time to time—now rubber tubes or gauze alone, now gauze and rubber dam—the best results seemed to be obtained. His patient was admitted practically unconscious. He had watched him for some time and had warned him of possibilities. When digging in the garden the patient suddenly began to develop a tremor on one side and fell down. His wife said that the tremor started in the right hand and then affected the right leg and then the whole body. In the region of the old abscess there was a large blood-clot which showed some signs of organisation, and, round this, there were a great many adhesions, which were freed. Decompression had been done on other cases which had had either a temporo-sphenoidal or a cerebellar abscess where there were adhesions in the region of the abscess.

Dr LITHGOW said that, with regard to the younger girl, her memory for naming objects returned within twelve hours of opening the abscess. The other case did not have loss of memory.

Dr W. T. GARDINER said that his first case was admitted comatose. He could not therefore be tested for aphasia; the morning after operation the temperature and pulse were normal, but, four days after operation, when drainage was interfered with, aphasia was present until the pressure was relieved.

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**A Series of Cases of Ozæna treated by Vaccines—**Dr ROBERT ROBERTSON (introduced by Dr W. T. Gardiner).

Dr MATHERS said that the Society was indebted to Dr Robertson for his report on the treatment of this rather troublesome and difficult condition.

Dr LOGAN TURNER said that the results obtained by vaccines in his hands had not been encouraging. In pre-war days a number of cases were so treated and closely observed, and the results were not considered satisfactory. He did not wish to prejudice the Society against the use of vaccines in ozæna, but he did not think that the results in Dr Robertson's series of cases were encouraging.

Dr WHITEHOUSE asked Dr Robertson what was the average duration of the treatment by vaccine in the ozæna cases and how often it was administered.

Dr GAVIN YOUNG said that certain investigators had associated syphilis and tuberculosis with this condition. He would like to ask Dr Robertson if he had taken any cognisance of this in preparing his vaccine.

Dr BROWN KELLY said that before the war, with the assistance of Dr J. F. Smith, he had treated a series of cases of ozæna with a vaccine of Perez bacillus. Watery secretion was increased and crusting was diminished, but the patients were not cured. Rhinologists should feel indebted to Dr Robertson for his efforts to benefit subjects of ozæna because they were very helpless in the treatment of this disease. He (the speaker) would not, however, regard the cases shown to-day as cures.

Dr ROBERTSON (in reply) said that all the patients expressed themselves as feeling distinctly the better of the treatment, more so than when under treatment by douching. He (replying to Dr Whitehouse) considered that a period of two years was necessary to effect a cure.

**Sarcoma of the Tonsil\***—Dr DOUGLAS GUTHRIE.—Female, aged 22, had suffered for four months from a sensation of swelling in the throat, difficulty of swallowing, and "thickness" of speech. A swelling, the size of a pigeon's egg, of firm consistence and bright crimson in colour, occupied the right tonsillar region. There were no enlarged cervical glands. On 9th October 1922, the tumour was easily and almost bloodlessly dissected out under general anæsthesia, and was found to be limited by the capsule of the tonsil. Dr James Dawson reported that the microscopic characters were those of endothelial sarcoma.

**Tertiary Syphilis of Palate, affecting Husband and Wife—**Dr DOUGLAS GUTHRIE.—J. A., aged 42, suffered from "a skin complaint" in 1917, and was treated by injections (? salvarsan). Since then he has suffered from tinnitus and deafness of left ear, and,

\* Previous cases are described in exhibitor's paper on "Sarcoma of the Tonsil," *Journal of Laryngology*, November 1918.

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during the past few months, from discomfort in the throat and pain behind the angle of the left jaw. The appearance at first suggested a syphilitic lesion, but is now obviously epithelioma.

Mrs A., aged 40, complained of pain in the palate and throat, also of severe headache several times a week. She has six children, the youngest aged 9 months. The condition of the palate is one of tertiary syphilis. The coincidence of the lesions of the palate in husband and wife appears unusual.

### **The Operative Treatment of Congenital Enlargement of the Nose: Lantern Demonstration—Dr DOUGLAS GUTHRIE.—**

The exhibitor stated that the patient had the misfortune to be born with an unduly large nose, and as she grew older the deformity increased. The deformity was rather aggravated than otherwise, in that, at the age of five, she underwent an operation for harelip. This, of course, narrowed the lip and caused the nose to become more prominent. Apart from the general enlargement of tissue the skin was unaffected. It was a pure and simple hypertrophy. At the age of eighteen she was anxious to have something done. The nose was reduced in size by the removal of a wedge-shaped piece of tissue from each side. The tissue included mucous membrane and cartilage, but not skin. After removal of the wedge of tissue, a malleable copper splint was applied, so that the nose was pressed upon and the edges of the incision within the nose brought together. The external part of the nose was thus reduced to a normal size, but the sides were unduly straight and the nose had a pyramidal shape, the curves of the alae being lost. In order to restore the natural curves of the alae, a second operation was performed ten days later, which consisted in the inward transplantation of each ala.

Dr W. S. SYME hesitated to criticise what was good work, but he thought that Dr Guthrie was asking for trouble. Some day, he will get a worse result than the appearance originally presented by the patient. The incision is made in the most septic part of the nose, just inside the vestibule, and unless the deformity is worse than it appears to have been in this patient, he (Dr Syme) would be inclined to leave it alone.

Mr J. J. M. Shaw was inclined to agree with Dr Syme that the treatment one would have adopted in this case would have been to encourage the girl to believe that her nose was not so abnormally large as to make it noticeable. It was a fairly common type of broadening in association with the condition of harelip from which this patient suffered. The antero-posterior dimension was apparently increased by comparison with the post-operative tightening and retraction of the upper lip. Dr Guthrie saw the patient, and was able to estimate the effect upon her happiness of the supposed disfigurement in a way which was not possible by the inspection of photographs. Once undertaken, the operative result would be considered satisfactory.

Dr DOUGLAS GUTHRIE agreed that these operations should not be indiscriminately performed, and in certain cases he had advised that the

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nose should not be touched. In this case, if either Mr Shaw or Dr Syme had seen the girl, he felt sure they would have been perfectly satisfied that it was wise to try to help her to look a little more presentable.

**Cancer in the Roof of the Post-Nasal Space with Secondary Deposit in the Right Carotid Triangle**—Dr NEIL MACLAY.—Male, aged 53, seen at end of September 1922, complaining of deafness in the right ear for over a year, and a lump in the neck for two months. The deafness was middle ear in type. In the right carotid triangle there was a small lump, firm but not hard, fairly movable and not tender. The right tonsil contained some septic plugs, and the post-nasal mirror showed what looked like adenoid tissue streaked with mucus. The tonsil was treated by local measures and a nasal douche employed.

On 12th October 1922, the gland mass seemed to be in the same condition: post-nasal space was cleaner, and it was possible to see on the right border of the adenoid growth a very small irregular area which was regarded as an ulcer. After some delay, owing to patient's objection to operation treatment, the gland mass was removed and the post-nasal space curetted on the 9th of November. The former was the size of a walnut, and the other tissue, which was removed in one piece, looked like adenoid tissue which had become fibrous in parts.

Histological examination showed both tissues to be carcinoma of spheroidal cell type. Radium was placed in the post-nasal space and X-ray radiation by deep method of Erlangen employed.

Dr GAVIN YOUNG said there was a good deal of pus under the middle turbinal on the affected side. He thought that possibly there might be some extension forward of the original condition into the antrum, or there might be merely antral suppuration.

Dr LOGAN TURNER thought the nasopharynx was in a very satisfactory condition. He agreed with Dr Young that there was pus in the middle meatus on the right side. There was some scar tissue in the site of the old tumour, and a little rough area as one passed towards the left side. He suggested to Dr Maclay that he might apply the diathermy button in that situation.

**A Short Note concerning a Case in which Endoscopic Search for a Fish Bone in the Gullet was followed by Cellulitis in the Neck and Abscess Formation in the Chest Wall under the Ribs**—Dr NEIL MACLAY.—(Published in the *Journal of Laryngology and Otology*, October 1923, p. 518.)

## DISCUSSION.

Dr W. T. GARDINER did not agree that the œsophagus was previously inflamed before the passage of the fish bone. He thought that the fish bone had stayed there and then passed through the wall of the œsophagus.

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He asked why general anaesthesia had been used for the ordinary examination for a foreign body by the direct method. He (Dr Gardiner) had removed nine or ten fish bones within the last year from the œsophagus, and he thought that as soon as the œsophagoscope was introduced, difficulty in getting down arose because there was œdema of the œsophageal wall above the foreign body. He had found in three or four cases that the bone was half-way through the gullet wall with half an inch projecting into the œsophagus. He thought that in this case the fish bone had probably passed through.

Dr CAMPBELL MACGREGOR had had a somewhat similar case—a man who complained of severe dysphagia and pain behind the manubrium sterni, having swallowed a haddock bone three days before. The œsophagoscope was passed, and, 10 in. from the teeth, the mucosa was found very pale and œdematous with the upper end of the fish bone fixed in both lateral walls. The bone was grasped and withdrawn without difficulty. It was a gill bone,  $1\frac{3}{4}$  in. in length and half an inch in breadth at the upper end, where there were two sharp points which had been impacted in the œsophageal wall. The patient was obviously ill and had the abdominal type of face, a subnormal temperature, and a rapid pulse. He was admitted to the ward, and though his temperature rose and the pulse rate remained high, he had less pain. His condition became much worse. Pericarditis and pleurisy were diagnosed on the second day, and he died early on the fourth day after admission. At post-mortem there was a double perforation of the œsophagus, acute mediastinitis, with mediastinal abscess (two pints of pus), pleurisy, and septic pericarditis. He thought it possible that the fish bone in Dr Maclay's case was still in position or had passed through the œsophageal wall into the soft tissues, and that there was no local inflammation prior to that. He (the speaker) might add that his patient had a very septic mouth (pyorrhœa and bad teeth), and had been trying to force the bone down with food during the three days before he reported.

Dr MARTIN said that Dr Maclay's short note raised one interesting point. Was the œsophagoscope to be passed in every case when a patient complained of swallowing a fish bone, when nothing could be found by the indirect method, the assumption being that the fish bone may have passed into and remained in the gullet, and be liable to cause a mediastinal abscess? He had had a somewhat similar case about a month ago. A man reported that he had swallowed a fish bone. In the examination he (Dr Martin) could find nothing except thickening in the lateral hypopharynx. Two or three days afterwards, the patient developed signs of abscess in the side of the neck and an X-ray showed definite gas formation in that region. Mr George Chiene opened it and found foul-smelling pus. The condition advanced to mediastinitis and death. No post-mortem was made, but in this case no fish bone was found.

Dr W. S. SYME asked what was the usual attitude of members towards the question of swallowed fish bones? Did they always pass an œsophagoscope and look for the fish bone? Many patients came complaining of having swallowed a fish bone, and when no sign of anything could be found, they were sent away.

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Dr BROWN KELLY said that he had had the same difficulty in deciding what to do. He did not care to pass the œsophagoscope without general anæsthesia, especially when looking for a fish bone. One was liable to push the bone deeper into the tissues if the patient retched. In the case of a private patient, careful consideration was desirable before sending him into a home and giving him general anæsthesia, otherwise, in many instances, the search might reveal the presence of no foreign body, and the trouble and expense incurred by the patient would have been in vain. If there was pronounced pain and complete inability to swallow, an examination should be made at once, but, if these signs were moderate or slight, he was inclined to wait a day and then find how the patient was ; if somewhat better, another day might be allowed to pass. If at any time, however, there was the apparent probability of a bone being impacted, an œsophagosopic examination should be made without delay.

Dr MACLAY (in reply) said he was glad that the case had excited some comment and interest. He joined issue with Dr Gardiner, and agreed with Dr Brown Kelly with regard to anæsthesia. He (the speaker) had removed many fish bones, but he had always used general anæsthesia and found it more convenient to do so. He did not always pass the endoscope when a patient told him he had swallowed something, but if it was a question of a fish bone, and there was a definite point of localised tenderness, he thought that one ought to do something to settle the question. With regard to the suggestion that the fish bone remained *in situ* and went through the gullet wall in his case, he thought the chances were that it would have been seen at the external operation or during subsequent dressings. Moreover, had it been overlooked as suggested, and allowed to remain embedded in the tissue, he did not think the external wound would have healed and remained healed for so long a period. The amount of inflammatory disturbance which he saw in the gullet was quite different to what he had hitherto experienced, and he did not see how it could all have taken place in twenty-four hours. He was disposed to think that some definite pathological change had taken place in the gullet prior to the time at which the fish bone was said to have been swallowed.

## Three Cases of Nasal Tuberculosis—Dr G. EWART MARTIN.—

(a) Female, aged 52, with a history of nasal obstruction for nine months: blow on the nose thirteen months ago: no pain: no previous trouble.

Seen 28.4.23. Right side of septum showed a lobulated, pale tumour, congested towards the anterior nares, hard to touch, situated at about half an inch from the front of the nose, on a level with the lower anterior part of the middle turbinal and inferior turbinal: nasopharynx clear: the tissue consists of numerous tubercles.

(b) Female, aged 67, with a history of nasal polypi: frequent cauterisation by her doctor. She began to notice her nose becoming sore on cold days.

Seen 9.6.22. Redness and swelling of left nostril with a small ulcer: nose blocked far back by pinkish swelling covered with

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some pus in the region of the inferior turbinal. Nothing to note on posterior rhinoscopy. Larynx normal. Wassermann negative. Small portion removed and reported on as suspicious of sarcoma; second portion showed appearances characteristic of tuberculous infection. After the removal of a portion, the disease spread to vestibule and on to the septum. With the diathermy knife all infected parts were cut out.

9/1/23. Still some granulations: treated with acid nitrate of mercury. This case is evidently on the border line between lupus and tuberculosis. Had apparently started far back in the nose in the region which had been frequently cauterised, spread forward to the skin margin, and had not shown any of the discrete, apple-jelly-like nodules so common in lupus.

(c) Girl, aged 13. Examined 5/4/23. Child's mother noticed a growth in the right nostril seven days previously. Patient had always spoken thickly, and was deaf for some time previously. There was a small, lobulated swelling (painless) on the right side of the septum: no extension on to skin margin: no post-nasal discharge: very slight adenoids: the tonsils enlarged and rather fibrous looking. Small portion of growth shows well-marked tuberculous infection. Beyond slight blepharitis and some corneal changes, the child is healthy. No signs of any lung trouble. She has always been healthy, and is the eldest of seven. Family history is good.

Dr BROWN KELLY said that as in these three cases growths had formed, they might therefore be termed tuberculomas. This affection was by no means common. There were differences of opinion as to whether it should be associated with lupus. A typical tuberculoma appeared as a growth with a lobulated, smooth, unbroken surface. If the surface ulcerated, an appearance might be produced similar to that of hypertrophic lupus in which the granulations were crowded together and there was a discharge of pus. The diagnosis depended upon the microscope which revealed tubercles, but bacilli were usually found only after a long search and in the deepest part of the growth. He asked the members whether they agreed with the view often expressed by writers, that patients with nasal tuberculosis developed pulmonary tuberculosis. He had a number of cases that were still evidently free from involvement of the lungs, although they had had nasal tuberculosis for many years.

Dr PETERKIN asked to what size these tuberculomata usually attained. He had a case of a woman about 30, who had evidently suffered from congenital syphilis. She had a flattened nose, perforation of her hard palate, and her nasal septum was almost completely destroyed. She was sent on account of nasal obstruction, and the nasal cavities were found occupied by a greyish, opaque-looking mass, which extended into the nasopharynx. A portion was removed and reported as being histologically tubercular. The mass was removed and in some months it recurred, and



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the patient reported again with the nose and nasopharynx filled with it, and the soft palate bulging. She was having difficulty in swallowing. He took a piece from the nasopharynx and submitted it to the pathologist, thinking that there must be something more than tubercle. He found it was sarcoma and removed the mass again pretty thoroughly, partly from the nasopharynx and partly through the hole in the palate, and submitted the whole mass again. He found histological tubercle and, upon staining, tubercle bacilli. The Wassermann was negative.

Dr MARTIN (in reply to Dr Brown Kelly) said that none of these cases showed any signs of a tubercular focus elsewhere. The lungs showed nothing. In each of the cases the Wassermann was definitely negative.

**Case of Rhabdomyoma of the Posterior Aspect of the Soft Palate**—Dr EWART MARTIN.—Girl, aged 6, with a history of discharge from nose and snoring at night. Lately the child had been inclined to be peevish and crying and disinclined for food: family history negative. She is the first child of the second marriage, and both parents have been previously married.

Seen 4/11/22. Tonsils large: post-nasal discharge. Examination of nasopharynx under an anæsthetic, when it was found to be filled with hard, polypoidal tissue, growing from the upper posterior part of the soft palate and the shelf at the lower border of the posterior nares. Tissue was examined by Dr F. E. Reynolds, who reported a rhabdomyoma.

5/3/23. Chloroform anæsthesia: the whole of posterior part of soft palate scraped: no signs of adenoids, and no appearance of new growth anywhere else in the nasopharynx.

15/3/23. Child now able to breathe through the nose. Nasopharynx clear, but a small roughness on posterior wall of soft palate, evidently a small portion which had not been thoroughly scraped.

Dr ALEXANDER reminded members that tumours of muscle were of two kinds, those arising from striped muscle and those arising from unstriped muscle. The latter, leio-myomata, were in the nature of the uterine "fibroid," perhaps the commonest of all tumours. The former, rhabdomyomata, were extremely rare. He had seen examples in the kidney and œsophagus. The tumours of striped muscle were usually simple in character, but many appeared to be potentially malignant, and this one was obviously very malignant and might be termed a rhabdomyosarcoma.

Dr MARTIN said that he had been unable to find another case of rhabdomyoma of the nasopharynx reported in literature. The tumour was usually found in the heart or in the kidney or bladder, and there were two cases reported in the œsophagus. The tumour itself looked rather like a mass of very hard, small polypi. Recurrence had taken place in the soft palate and the cervical glands were enlarged.

# ABSTRACTS

## EAR

### *The Low-Hilger Audiometer.*

The two most pressing needs of the present day to workers in problems of sound, are probably an accurate and convenient method of measuring the intensity of sound in standard units, and a ready method of recording graphically the wave forms of different sounds. It is probable that many advances in acoustical science would take place as the direct outcome of the production of reliable instruments for these purposes. Fortunately, scientific instrument makers are occupying themselves with the problem of constructing such instruments.

In September 1922, the Low-Hilger audiometer was shown at the British Association meeting at Hull. In principle, it consists of an extraordinarily delicate disc, of which a small portion is platinised to form a mirror. Light reflected from the mirror is focussed accurately on to a rotating cylinder, round which a photographic film is wrapped.

A wave of sound striking the disc causes a deformation of it, so that the beam of light is deflected upwards or downwards, and the deflections of the beam are recorded as a curve on the moving photographic film.

Several patterns of discs are used, according to the loudness of the sound to be tested. These discs are interchangeable. They are of celluloid, rubber, or other material according to the sensitivity required. The makers state that the thinnest discs which they supply are made of a thickness down to a fraction of wave length of light ( $1\mu$  or less). In such a diaphragm the inertia would be extremely small and the air damping extremely great. They would give a near approximation to a "dead-beat" oscillation. In the case of the heavier discs for less delicate experiments, the natural period of the disc has to be reckoned with. By varying the diaphragm and the focal distance of the lenses, the instrument can be adapted for recording sounds whose amplitudes differ by more than 100 to 1.

A series of curves representing vowel sounds recorded by the instrument are given as illustration of what it is capable of. These curves show the various components of the compound wave with great regularity and distinctness.

The instrument can also be adapted for demonstrating sound curves on a screen to lecture audiences.

GEORGE WILKINSON.

# Nose and Accessory Sinuses

## NOSE AND ACCESSORY SINUSES

*Syphilitic Chancre of the Pituitary Mucosa.* JACOD and PITRE.  
(*Annales des Maladies de l'Oreille, du Larynx, du Nez et du Pharynx*, February 1923.)

In cases previously reported, distinction has not always been made between chancres affecting the skin of the nostril and those of the nasal mucosa. The authors describe 4 cases, 2 of the septum, 1 of the inferior and 1 of the middle turbinal. Only 58 other cases are found of indisputably intranasal chancre, 52 on the septum, 5 on the inferior and 1 on the middle turbinal.

The etiology is often obscure. The fingers, or a handkerchief, are the usual mode of infection. Histologically, the growth resembles a subacute inflammation, with numerous spirochaetes present. The condition is insidious in its onset, sometimes adenitis being the first sign. Later, complaint is made of unilateral discharge and obstruction, with pain. The last may be very severe, resembling trigeminal tic. General malaise is usually present. In the affected nares the mucosa is much swollen, and covered with muco-pus. Application of cocaine and adrenalin may be necessary to disclose the tumour. The glands are, as in other syphilitic lesions, separate, shotty, multiple and callous, though the presence of nasal sepsis may mask this. The condition may simulate malignant disease.

Discovery of the spirochaete is the only diagnostic help at the beginning, the Wassermann reaction being often negative at that stage.

GAVIN YOUNG.

*Endo-Nasal Drainage of the Lachrymal Sac.* H. HERZOG.  
(*Münch. Med. Wochenschrift*, No. 16, Jahr. 70.)

Although the author has but lately performed this operation and the material at his disposal has been limited, Herzog is an enthusiastic advocate of the method in preference to all others in the treatment of chronic dacryocystitis.

The operation must be considered conservative rather than radical; it is immediate in its effects and establishes a normal drain for the lachrymal secretion without any resultant disfigurement. Herzog has successfully carried out the operation in cases complicated by acute inflammation of the surrounding soft parts. Absolute local anaesthesia and ischaemia are obtained by infiltration of the whole wound area.

Herzog follows the operative technique of Halle, that is, he raises a flap of mucous membrane from the atrium nasi and subsequently makes use of this flap to cover the edges of the bone wound and so inhibit the formation of granulation tissue. Only the medial wall of the sac is removed. The first dressing which is removed

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after two days is succeeded by the application on alternate days of small bits of gauze covered with ointment. The after-treatment is kept up for two to three weeks. JAMES B. HORGAN.

*A Case of Recurrent Suppurative Frontal Sinus Disease.*

E. WATSON-WILLIAMS. (*Lancet*, Vol. ii., p. 1056, 1923.)

The author describes the case of a man, aged 26, whose left frontal sinus had been operated upon by the external method. An attack of influenza resulted in serious recurrence. A complete operation was performed with excellent result. The point of special interest in the case was the prolongation backwards of the sinuses at the outer angles to the extent of one inch. MACLEOD YEARSLEY.

*Acute Pan-Sinusitis: A Severe Case.* Sir ST CLAIR THOMSON.

(*British Medical Journal*, 2nd June 1923.)

It is quite uncommon for an acute sinusitis to run a course of any length without some secondary infection becoming the predominant disease. This article records a case of fever in which the temperature was raised for five weeks owing to acute pan-sinusitis, of which the only complication was the unusual one of suppuration in the thyroid gland. The only active treatment was repeated lavage of both maxillary sinuses, the author pointing out the risks of active surgical interference on the other accessory cavities during an acute sinusitis. AUTHOR'S ABSTRACT.

*Optic Neuritis of Sphenoidal Sinus Origin.* Sir ST CLAIR THOMSON.

(*Brit. Med. Jour.*, 2nd June, 1923.)

In this case of left optic neuritis pus was seen on the floor of both sides of the nose and upon the roof of each choana. The depreciation of vision had lasted eight days. A few days of conservative treatment—radiant heat, inhalations, and aspirin having produced no improvement, and the ostium of the left sphenoidal sinus being inaccessible for catheterisation owing to enlargement of the middle turbinal, it was decided to operate. The turbinal on each side was prised from the septum, but not removed, and both sphenoidal ostia were enlarged. After four days, lavage was carried out and repeated regularly until the discharge ceased. The vision began to improve from the time lavage was instituted. The ophthalmic surgeon's report of progress is included in the case report.

The author discusses, in the light of recent papers on the subject, the question of the advisability of operating on the sphenoidal sinus for retro-bulbar neuritis in cases where no pus is found in the nose. This part of the paper cannot be summarised—it must be read in full. T. RITCHIE RODGER.

# Peroral Endoscopy

## PERORAL ENDOSCOPY.

*The Question of the most Advantageous Position of the Patient for Esophagoscopy and Bronchoscopy.* GEORG SHUKOFF, Petrograde. (*Zeitschrift für Hals-, Nasen- und Ohrenheilkunde*, Bd. II., S. 344, 1922.)

By means of vertical sections of the cadaver, the writer studies the position of head and neck most favourable for the introduction of the rigid instrument. The illustrations given in the paper are very striking and convincing in confirmation of his opinion that the prone position is the most convenient. The patient is placed on a table of such a height that its edge is on a line with the examiner's chin. The assistant stands on the left side of the patient, puts his arm round the patient's head and raises it so that the mouth is on a level with that of the physician. The patient holds out the tongue with his right hand, while his left one lies along the side of his body. The bending of the head is effected entirely through the movement of the upper cervical vertebrae, the lower ones being fixed by the weight of the head and the hand of the assistant; in a word, in the prone position the floor of the mouth and of the pharynx form a straight line which facilitates the introduction of the instrument and is of great practical value, especially when we think of such complications as coughing and vomiting.

JAMES DUNDAS-GRANT.

*The Mechanism of Physical Signs, with Special Reference to Foreign Bodies in the Bronchi.* CHEVALIER JACKSON. (*Amer. Journ. of Med. Sc.*, March 1923.)

In all cases of suspected foreign body in the lung, the physical signs should be carefully studied. Owing to the constant movement of the bronchi, the shifting of secretions and the movement of the foreign body, the physical signs, like the endobronchial pictures, are liable to incessant changes. The signs of diagnostic value are those of complete or partial bronchial obstruction. They are (1) limited expansion; (2) decreased vocal fremitus; (3) impaired percussion note; (4) diminution of breath sounds distal to the foreign body. The diminished expansion, with dullness, may suggest pneumonia, but the decreased vocal fremitus and resonance, and the absence of tubular breathing soon correct the impression. The paper is illustrated by a coloured plate representing the bronchoscopic view in various foreign body cases; in each case the physical signs are described in the text.

DOUGLAS GUTHRIE.

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*Cicatricial Stenosis of the Œsophagus caused by Commercial Lye Preparations.* LOUIS H. CLERF, M.D. (*Journ. Amer. Med. Assoc.*, 2nd June 1923.)

The writer reports twenty cases of this condition, treated during the previous sixteen months in the Bronchoscopic Clinic at the Jefferson Hospital. The ages of the patients varied from 22 months to 58 years. In thirteen, gastrostomy was necessary owing to malnutrition and to the condition of water hunger experienced by some of them. One patient was admitted in a moribund state, and one who had had gastrostomy performed, died shortly afterwards. Dilatation of the stricture was carried out in the majority of the cases by the retrograde method.

The swallowing of lye was almost invariably an accidental occurrence, the solution or powder being left carelessly within the reach of the children. The author attributes this to the lack of knowledge of the highly poisonous nature of the preparation, the labels conveying no information as to its dangerous qualities. He finds it difficult to understand why the necessary legislation has not been provided to prevent these pathetic occurrences.

A. LOGAN TURNER.

## REVIEWS OF BOOKS

*La Voix.—Anatomie, Physiologie, Conseils, Soins Médicaux.* Dr MOUNIER. 21 illustrations, 86 pages. Paris: Vigot Frères, 23 Rue de l'École de Médecine, 1923.

In the eighty-six pages of what the author calls "*ce modeste traité*," there is contained a large amount of useful information very clearly and interestingly set forth. Much of it is, of course, of a very elementary character, but many valuable points are brought out in few words. In reference to the "attack," the writer dwells on the importance of the cords being in contact at the moment, so that the sound may be pure and free from breathiness. He considers the lower costo-diaphragmatic method of breathing to be the only reliable one. He discusses the different kinds of voice and utters the caution that voice trainers would make fewer mistakes in the classification of voices if they called in the opinion of a laryngologist, as he believes that one can almost certainly affirm the nature of the voice after laryngoscopic examination.

The author lays down certain rules which we think will receive fairly universal acceptance: (1) Not to start a course of instruction without complete examination of the nose, pharynx and larynx, and the rectification of any defects; (2) before the voice is "placed" to teach the pupil how to breathe; (3) to confine the teaching to

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solfeggi so long as the voice is not equal in its whole range (this involves a strain on the patience which some of the less determined pupils may resent); (4) to make the pupil sing in Italian, as the use of that language, as compared with French, tends to bring the voice forward.

In discussing the hygiene of the singer, the author protests against the excessive use of peroxide of hydrogen, also against watery irrigation of the nose, finding that oily sprays serve every purpose and are free from all objections. The chief diseases which impair the efficiency of the singer are passed in review, and the greatest stress is laid upon digestive troubles, as he maintains that impairment of digestion has a tendency to cause increased secretion of the glands of the trachea, which frequently shows itself in the interference with the production of tone by a collection of mucus on the vocal cords and what the French singers call "*chats*." Numerous useful prescriptions are given for the various forms of catarrh of the pharynx and naso-pharynx. Several of the pages are occupied with a description of the regime which the singer has to follow if he is to preserve his efficiency in its highest degree. However, he is enjoined not to adopt too severe a regime.

The author is opposed to the use of inhalations in cases of congestion of the cords and attaches much more importance to the recognition of some nasal or gastro-intestinal disturbance. He avoids intralaryngeal manipulations as much as possible, and recommends very strongly the insufflation of warm air saturated with various antiseptic medicaments; these are carried out always through the nose and not directly into the larynx. He describes several forms of apparatus for facilitating these insufflations. He gives some rules for the use of massage and electricity, but he rejects all forms of intralaryngeal electrodes; he confines himself to the use of the Faradic current applied externally for the larynx or internally for the muscles of the palate. He refers rather vaguely to the value of electricity in paralysis of one or both vocal cords, a method of treatment to which he considers too little attention has been given.

The work, without being profound, is very practical, and even if it does not convey very much fresh information to the specialist, it affords him convenient methods of conveying information to his vocal patients.

JAMES DUNDAS-GRANT.

*A Clinical Study of the Labyrinthine Fistula Symptoms and Pseudo-fistula in Otitis.* By C. O. NYLÉN. (*Acta Oto-laryngologica Supplement*, III., 1923.)

This work is described as an academic dissertation for a medical degree, and is dedicated by the author to the memory of his father. It covers some five hundred pages and is an exhaustive monograph of

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the subject, including an historical review, an account of the author's own observations and conclusions, and notes of 170 cases.

By the term "fistula symptom" was originally meant the eye phenomena evoked by compression or rarefaction of air in the external meatus. It is now known, however, that similar symptoms may arise from direct pressure on a labyrinth fistula or on the tragus or on a polypus; and closely allied phenomena have been described, such as Hennebert's luetic symptom, H. S. Mygind's vascular fistula symptom, and the pseudo-fistula symptom of Karlefors and Nylén. The author suggests, therefore, that it would be well to let the term "fistula symptoms" include all those which point to the presence of a labyrinthine fistula with undestroyed labyrinth, such as the pressure, vascular, galvanic, caloric, and osmotic fistula symptoms; and by the term "pseudo-fistula symptoms" to designate similar phenomena which are met with, either in the absence of a fistula or when one is present, but the labyrinth destroyed.

With regard to the frequency of the ordinary pressure fistula symptom, the author's statistics show that it was met with in 13 of 3386 cases of acute otitis media (about 0.39 per cent.), and in 122 of 1631 cases of chronic otitis media (about 7.4 per cent.). It may occur at any age from 5 to 80 years, but was found most often during the fourth decade. It was present in men more frequently than in women in the proportion of 90 to 75.

In the past, attempts have been made to infer the position of the fistula from the nature of the response to the pressure, vascular, and other fistula tests; the author's observations, however, show that this cannot safely be done. The typical fistula symptoms are sometimes present when the horizontal semicircular canal is intact and the fistula is on some portion of the inner tympanic wall; also the "reversed pressure fistula symptom," which was formerly supposed to indicate the presence of a fistula at some point other than the horizontal canal, is now known to occur more often when this canal is eroded than when the fistula is situated elsewhere. The vascular phenomena associated with labyrinthine fistula, described by Mygind, in 1918, are very common and may be of great assistance in the diagnosis of fistula in doubtful cases, when the classical fistula test is negative or uncertain, but the hopes entertained by Mygind that his "vascular fistula test" would increase the possibilities of determining the position of the fistula have not been fulfilled.

Of a number of cases which gave either the typical or the reversed pressure fistula symptom before the radical operation, about one-third were found by the author still to give the reaction when examined several years after the operation.

The pseudo-fistula symptoms are considered at some length.



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Hennebert's pressure pseudo-fistula symptom, which is generally "reversed," may be regarded as confirmatory evidence of syphilis when it is associated with other labyrinthine abnormalities, such as, evident disproportion between the caloric and rotatory reactions, vaso-motor pseudo-fistula phenomena, and a negative Rinne test. Karlefors and the author carried out an investigation of the pseudo-fistula symptom in non-leucic patients and obtained a positive result in 2 per cent. of persons with normal tympanic membrane, and in about 50 per cent. of cases with perforation, the disease being chronic, acute, or residual. They observed in those who reacted: (1) that on compression in the auditory meatus, after a latent period lasting two or more seconds, there developed a horizontal rotatory nystagmus towards the side tested, and that aspiration produced a similar nystagmus in the opposite direction; (2) that on immediate repetition there was either a negative result or a greatly lessened response which on further repetition disappeared; (3) that the reaction could be evoked again after an interval of at least a minute; (4) that in cases with tympanic perforation, on healing of this the reaction ceased; and (5) that the reaction was seldom obtained before the pressure had reached from 80 to 100 mm. of mercury.

The vaso-motor pseudo-fistula symptom (nystagmus following compression of the vessels of the neck in the absence of any fistula of the labyrinth) has been noted in a few cases of syphilis, and similar phenomena have been seen in certain cases of organic intracranial disease and in hysteria. Whether pseudo-fistula symptoms may arise when the sensory epithelium of the labyrinth has been completely destroyed is doubtful, but certain observations support the view that eye movements may follow direct irritation of the vestibular nerve fibres.

"The chief thing, from a practical point of view, is to decide from the symptoms observed: is there a labyrinthine fistula with a labyrinth, as yet, not undestroyed, or is the capsule of the labyrinth intact, or is there possibly a labyrinthine fistula present and a destroyed labyrinth? In other words, are the symptoms those of fistula or pseudo-fistula?" While it must be admitted that there is no one symptom which is certain evidence of the presence of a fistula, yet if syphilis can be excluded, a positive reaction to the pressure test (both compression and aspiration) gently applied is almost clear proof of an undestroyed labyrinth with a lesion of its bony wall. The vaso-motor and vascular symptoms, though less frequently present and more difficult of observation, are occasionally valuable aids in diagnosis.

As regards treatment, the general opinion at first was that operation should always follow the diagnosis of a fistula. The experience of recent years has, however, proved that operation in these cases is not always necessary, and "the treatment at present tends towards

## Letter to the Editors

conservatism." The least indication of any form of intracranial complication of course renders operation imperative; when, however, conditions outside the labyrinth itself do not call for operation, a rational conservative treatment is suitable, at any rate to begin with, even if the labyrinth is quite unresponsive to any of the other tests.

The last section of the work is devoted to the mechanism of the pressure and vaso-motor symptoms, and the author's opinion is that many of the phenomena may be explained by purely mechanical conditions within or outside the labyrinth. As the result of experiments on guinea-pigs in whose horizontal semicircular canals fistulae were made after removal of the otoliths by centrifugal force, he arrived at the conclusion that the otoliths play no prominent part in the production of the pressure fistula symptom.

The last seventeen pages of the volume are occupied by references to the literature of the subject and form a complete bibliography.

THOMAS GUTHRIE.

## LETTER TO THE EDITORS.

### MÉNIÈRE SYMPTOM-COMPLEX

TO THE EDITORS,

*The Journal of Laryngology and Otology.*

SIRS,—I have had two patients who showed the Ménière symptom-complex without the end-result of complete unilateral deafness usual in a case of true Ménière, *i.e.*, apoplexy of the labyrinth.

The first occurred nine or ten years ago in a man about 43 years of age. He was the owner of a large business, which he took and continues to take rather seriously. His attack began with vertigo and "rushings" in the head, and he would fall down or off his bicycle, but he never became unconscious. On most occasions he vomited at the zenith of the attack, which lasted about six hours. One of his ears showed slight adhesive otitis media with (?) some otosclerosis. The attacks came on about every second or third day. As I could do nothing for him, he endured it and in three years the attacks abated, and six months later they ceased, "because he used his will." One ear is moderately deaf but not markedly so.

The second case is that of a lady of 50. Eighteen months ago she came to me complaining of deafness in the *right ear*, of gradual onset, with "roarings." There was otosclerosis present as well as slight adhesive otitis media. She also suffered markedly from hay fever. I gave her a course of galvanism and oto-massage, without any improvement. The deafness in her right ear was

## Letter to the Editors

peculiar; to low sounds and fine high sounds she showed  $\frac{1}{2}$ . To medium range and voice, there was very little evidence of defect.

In September last, her hay fever began to be more troublesome, and the first symptoms of the Ménière complex showed themselves. These came on about once in ten days. Some years ago I had told her that a submucous resection would do her good, because the nose was narrow outside and much obstructed inside. The operation was done in October last and relieved a sense of weight in the right ear, also the noises to some extent, *i.e.*, it affected the otitis media by allowing air to enter freely. Valsalva's experiment was now possible, whereas, formerly, she had been unable to perform it.

Unfortunately, the pseudo-Ménière attacks began to occur more frequently, happening thrice weekly with great regularity. First would arise a heaving in the brain followed by ataxia, which made her seek her bed. The blood pressure, usually 100-130, now rose till the pulse was pounding. Within half an hour, vomiting came on and continued until the stomach was emptied. Nystagmus and vertigo were very violent.

The attack lasted on the whole less than twelve hours. Next day she was quite well except for slight lassitude and some pallor. Bromides, strychnine, iron, arsenic, luminal, and other things have been tried. Luminal controlled the attacks simply by its soporific action.

My own opinion was that the causation was outside the ear, and arguing from the hay fever, that it was a vaso-motor disturbance produced by some irritant.

Professor Carmalt Jones, of Otago University, was called in with a view to discovering a protein which might be the exciting cause. Dr Pearson, our pathologist, is now giving her sera from flowers and grasses. These are controlling the attacks, which are less frequent and not so violent. I think the case will wear itself out like the former.

My theory is that the otosclerosis has so affected the labyrinthine bone as to obstruct the ductus endolymphaticus, and the internal ear cannot adjust itself to sudden vaso-motor changes. The cure will depend on arterio-sclerosis of advancing years, thus making the arteries less distensible and so obviate the changes in pressure. It is noteworthy that the patient is not very deaf.

These two cases are not, of course, examples of true Ménière's disease, which produces profound deafness and where there are rarely more than from one to three attacks.

I shall be glad to get any light which may be thrown on these cases.—Yours faithfully,

T. A. MACGIBBON.

CHRISTCHURCH, N.Z.

# General Notes

## GENERAL NOTES

ROYAL SOCIETY OF MEDICINE,

1 Wimpole Street, London, W. 1.

*Section of Laryngology*—President, Mr H. J. Banks-Davis, M.B., F.R.C.P.—*Hon. Secretaries*, Mr J. F. O'Malley, F.R.C.S., and Mr E. D. D. Davis, F.R.C.S.

The first Meeting of the Section, Session 1923-24, will be held on Friday, 2nd November, at 4.45 P.M. Members who are desirous of showing patients or specimens should give notice of the same to the *Senior Hon. Secretary*, Mr J. F. O'Malley, 6 Upper Wimpole Street, London, W. 1, at least twelve days before the Meeting.

*Section of Otology*—President, Mr Sydney Scott, M.S. *Hon. Secretaries*, Mr Archer Ryland, F.R.C.S.(Ed.), and Mr T. H. Just, F.R.C.S.

The first Meeting of the Section, Session 1923-24, will be held on Saturday, 3rd November, at 10 A.M. Members who are desirous of showing patients or specimens should give notice of the same to the *Senior Hon. Secretary*, Mr Archer Ryland, 50 Harley Street, London, W. 1, at least twelve days before the date of the Meeting.

The attention of Members of the Section of Otology is drawn to the change in the dates of the Meetings of the Section during the ensuing Session. They will no longer be held, as formerly, on the third Friday of the month, but on the first Saturday of the month, on the day following the Meeting of the Section of Laryngology. The hour of the Meeting has been fixed at 10 A.M.

A Conjoint Summer Meeting of the Sections of Laryngology and Otology will be held in London, on Friday and Saturday, 27th and 28th June 1924.

During the Session 1923-24, certain subjects of general interest have been selected for debate by the various Sections of the Royal Society of Medicine. On Friday, 7th December, at 8.30 P.M. the Sections of Anæsthetics, Laryngology, Otology, Odontology, Ophthalmology, and Surgery will discuss "The Comparative Value of Cocaine Substitutes."

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THE SEMON LECTURE, 1923.

Dr A. Logan Turner, Edinburgh, has been invited by the Semon Lecture Board to give the Semon Lecture, University of London. The Address, entitled "The Advancement of Laryngology and Otology: A Plea for Adequate Training and Closer Co-operative Action," will be delivered in the Hall of the Royal Society of Medicine, on the afternoon of Thursday, 1st November, at 5 o'clock.

\* \* \*

At the Meeting of the Eleventh International Physiological Congress, held in Edinburgh from 23rd to 27th July, under the presidency of Sir Edward Sharpey Schafer, Professor Magnus of Utrecht demonstrated the postural reflexes due to the labyrinth and mid-brain; and he showed how the balancing and righting reactions can be analysed into a series of simple reflexes in guinea-pigs and rabbits from whom the cerebrum has been removed.

# General Notes

## DIPLOMA IN LARYNGOLOGY AND OTOTOLOGY.

(D.L.O.R.C.P. & S. Eng.).

In our previous issue we published the Regulations of the new Diploma in Laryngology and Otology recently drawn up by the Management of the Examining Board of the Royal College of Physicians of London and the Royal College of Surgeons of England. We again draw our readers' attention to the subject.

It had long been felt by those interested in maintaining a high standard of work in laryngology and otology, that such of the School Medical Officers, and others, whose chief duties lay in dealing with the diseases of the ear, nose, and throat, should receive some "hall-mark" or certificate, which would ensure that they had received, at least, a sufficient amount of training to fit them for the efficient discharge of their responsibilities. Hitherto, in many cases, the only qualification which seemed to be necessary was the ability of the medical officer to remove adenoids and tonsils.

With the establishment of a Ministry of Health and a consequent increase in the activities directed towards the preventive treatment of disease, the necessity of ensuring adequate preliminary training for these officers has become more clamant. Steps were taken, therefore, to provide the means of obtaining the necessary qualification.

In all probability, it will become obligatory for those candidates seeking appointments under the Ministry or the Educational Authority, in which diseases of the ear, nose, and throat will constitute a large proportion of their duties, to obtain the above Diploma before they are eligible for election. No fault can reasonably be found for insisting upon this. The public will benefit from the trained services of the officials, and the science and art of laryngology and otology will gain additional prestige.

The regulations have been drawn up in such a way as to ensure that the successful candidates have procured a practical knowledge of the more common diseases. The examination for the Diploma is, in no sense, of the nature of an Honours Examination, nor has it been designed with the object of creating "specialists."

We feel that those members of the Councils of the Sections of Laryngology and Otology of the Royal Society of Medicine, who have worked persistently to bring about this desirable result, deserve due praise for the successful issue of their labours, while the Conjoint Board is to be congratulated on the step which it has taken to put it into effect.

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## POST-GRADUATE TEACHING AT THE CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL.

Under the auspices of the Fellowship of Medicine and Post-Graduate Medical Association, the Staff of the Central London Throat, Nose, and Ear Hospital, Gray's Inn Road, have prepared a very full course of instruction covering the period October 8th to 26th inclusive. The prospective programme of work includes not only clinical instruction in the Wards and in the Out-patient Department, but Surgical Anatomy and Operative Surgery classes. The programme has been so arranged that those wishing to take full advantage of it will be able to devote the whole of each day to the study of the specialty.

## General Notes

The Secretary to the Fellowship, 1 Wimpole Street, London, W. 1, will be pleased to give further information as to the course, and to receive the names of those desiring to attend it.

\* \* \*

### BRAIN ABSCESS.

We publish, in this number, the Proceedings of the Section of Otology of the Royal Society of Medicine of 18th May, and those of the Scottish Society of Otology and Laryngology of 9th June, and it is interesting to observe that two similar topics held the attention of the members at both Sessions. We refer to the post-operative drainage of brain abscess and the occurrence of epileptiform seizures subsequent to operation upon temporo-sphenoidal abscess. The first is an old-standing subject, and it is evident that there is still no royal road to recovery through any single method. To judge from the remarks of those members who took part in the discussion, there is considerable variation in the means adopted for securing satisfactory drainage; the old rubber tube, corrugated rubber tissue, rubber dam, gauze strips, irrigation and suction, and the removal of a portion of the wall of the abscess, were mentioned by various speakers as suitable agents for the purpose: *quot homines, tot sententie!*

At each Meeting, a case was shown in which Jacksonian fits had developed after operation for the relief of temporo-sphenoidal abscess, in one patient, two, in the other, six years after treatment; and other cases of a somewhat similar nature were referred to. Both these topics would undoubtedly furnish interesting material for a collective investigation and discussion.

\* \* \*

### A HINT TO THE RETIRED MEMBERS OF THE PROFESSION.

"Why do not doctors take more often to literature? They have not much time, it is true, but they do get some time for recreation, and the temptation to write fiction, if they have any turn at all for letters, must be, one would have thought, enormous. Secrecy is a point of honour with every decent doctor, and the medical profession *en masse* uphold that honour to admiration. But how often they must long to tell all they know! In fiction they would find a perfect outlet. Yet how few, even among retired doctors, and many of them can afford to retire very early, devote their leisure to their pens! They are highly educated men, but they do not share the desire of the other learned professions to confide in paper. Hundreds of men of letters begin as barristers, and a good many as clerks, schoolmasters, and parsons, yet none of these have such facilities for studying human nature as the doctor possesses. Perhaps the training has something to do with it."—*The Spectator*, 30th August.

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### QUERIES AND ANSWERS.

A suggestion has been made that it might prove useful to our readers if an opportunity was afforded them, through the pages of the *Journal*, of asking for information regarding points of doubt or difficulty, which may, from time to time, arise in connection with their work.

It is proposed, therefore, to open a correspondence column, under the above title, and to take the necessary steps to supply the information that may be desired.

# The Journal of Laryngology and Otology

(Founded in 1887 by MORELL MACKENZIE and NORRIS WOLFENDEN)

## NASO-PHARYNGEAL FIBROMA: A CLINICAL AND PATHOLOGICAL STUDY.\*

BY PERRY G. GOLDSMITH, C.B.E., M.D., C.M., Toronto.

A TUMOUR formation, histologically non-malignant but pursuing clinically a malignant course, occurring almost entirely in the young male, and definitely retrogressing about the age of twenty-three, is unique among tissue growths, and is found alone in the naso-pharynx. Females are not, however, immune, since Pluyette, in 1887, was able to record nine cases in the sex.

### Site of Origin and Pathology.

Tilley<sup>1</sup> says that the origin of these tumours, when confined to the nasal cavity, may be in the sphenoid-ethmoidal recess,<sup>2</sup> or there may be a more extensive origin involving the arch of the choana, base of the vomer and pterygoid process, fossa of Rosenmüller, ethmoid and sphenoidal sinus, or, even the maxillary antrum. Tilley<sup>3</sup> records one case growing from the antrum.

The most common seat of origin is from the fibrous tissue of the muco-periosteum covering the basilar process of the occipital bone, the body of the sphenoid, and the anterior surface of the cervical vertebræ; that is to say, they are of periosteal origin and tend to cease growth when active periosteal growth has terminated and the skull has ceased development. Sir St Clair Thomson,<sup>4</sup> and Parker and Colledge<sup>5</sup> find them most often on one side of the middle line, while Escat finds the left side more often the common site. Ferrier,<sup>6</sup> while

\* Paper read before the American Laryngological Association, Atlantic City, 17th May 1923.

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admitting the possibility of tumours springing directly from the vomer and choanal regions, believes the origin is due to an anomaly in the development of the functions of the hypophyseal system, and to a deviation in function of the pharyngeal tonsil. This he explains by assuming, (*a*) that at a certain moment epithelial germs may regain their power of proliferation; (*b*) the chromophilic cells to which glandular characteristics are attributed, increase their secreting action and stimulate the periosteum of the roof of the pharynx to produce tumours resembling naso-pharyngeal fibromata.

It is not always easy to define the original point of origin since, in rare instances, they have been found to grow from the lateral wall of the pharynx and the internal pterygoid process of the sphenoid. Secondary attachments are not uncommon, due to tissue necrosis from pressure or friction. The surface of the tumour is covered by mucous membrane under which are found large ramifying blood-vessels, but there is no thick envelope to which the term capsule might be applied. The mass is made up of dense fibrous tissue and agglomerated cells, pedunculated or sessile in shape, and containing large venous channels most abundant in the peripheral portions.

Walsham<sup>7</sup> states: "It is impossible to say beforehand that the tumour is a pure fibroma or that it will not recur after removal, since, in many cases, round cells are found which resemble fusiform or embryonic sarcoma." Jonathan Wright<sup>8</sup> says: "Just in so far as the cellular richness is marked, the question of the differential histological diagnosis of sarcoma arises."

When the venous channels within the mass are large, thin-walled, and numerous, the term fibro-angioma has been fittingly applied. In such cases, on section, the growth has a spongy appearance and the walls may be formed by simple embryonic elements. The macroscopical appearance of the growth is pink, dark red or purple, according to the vessel formation of the covering mucosa.

The attachment varies in size according to its seat of origin. The more anterior the seat of origin the smaller the pedicle, the less dense the fibrous masses, and the greater the œdema. In several specimens of pedunculated growths in St Bartholomew's Hospital Museum, the pedicle is short and measures as much as an inch or more in diameter.

Coates<sup>9</sup> has reported a case in which there was present a



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nasal and a naso-pharyngeal fibroma. He quotes Getchell, who says that the nasal fibroma occurs in either sex and more often in those past middle life.

Pierce's<sup>10</sup> assertion that they are never multiple is controverted by one of my cases in which I found one large and two small fibromas.

Two varieties of tumour occur, according to Ferrier<sup>11</sup>; the true vascular fibroma shows a nucleus of homogeneous structure which imitates that of the periosteum; it is surrounded by an extremely vascular covering which springs from the aponeurosis of the sphenoccipital recess. Tumours, however, growing from the edge of the choana which tend to grow forward into the nose, show a different structure with varying degrees of malignant degeneration and more rapid growth.

When the growth arises from well within the choanal arch from the Schneiderian membrane, the amount of fibrous tissue may be very slight and closely approaches the character of an ordinary nasal polypus; this, too, applies to choanal polypus, the attachment of which is generally found just within the maxillary antrum. It is difficult in reviewing the literature, as Coates has so thoroughly done, to make sure that the cases reported as fibromas have really the right to be classed as such.

Thomas Guthrie<sup>12</sup> says: "The so-called choanal polypus has no affinity either in structure, origin, or clinical features to true fibroma, yet they are often reported as such. A microscopical examination shows this to be essentially a polypus with a large amount of fibrous tissue development."

In an analysis of a series of cases published prior to 1898, Walsham<sup>13</sup> was unable to satisfy himself as to the frequency of recurrences after removal, but in none of the cases described as pure fibromas was a recurrence reported.

The tumours with which this paper deals are those consisting largely of hard, dense, fibrous masses without sarcomatous elements or connected with pre-existing adenoids (Wright's fibro-lymphoid tumours). They do not produce secondary enlargements of neighbouring lymphatic glands, nor does metastasis occur. In their enlargement, destruction of adjacent structures is by pressure and not by infiltration as in malignancy. They must not be confounded with the soft gelatinous, freely movable masses frequently invading the naso-pharynx from the nose.

The amount of destruction following gradual enlargement of

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the mass may be astonishing. The naso-pharynx may be greatly widened, laterally causing occlusion of the Eustachian orifice and middle ear involvement. The nasal septum may be pushed to the outer nasal wall with loss of all its osseous and cartilaginous structure. The sphenoidal sinuses and posterior ethmoidal labyrinth may be filled with prolongations of the growth causing optic atrophy, proptosis, and even basal meningitis. The nose may be widened, maxillæ separated, and the antra filled, giving the patient a frog-face appearance.

The pressure necrosis may involve large vessels leading to rapid and fatal hæmorrhage. Extensive sloughing of the tumour itself, or the surrounding tissue, may lead to sepsis, pyæmia, or septic pneumonia. The secondary anæmia from repeated hæmorrhages, together with the result of chronic septic absorption, readily induces the appearance of cancerous cachexia. Occasionally, these masses have been known to slough away or undergo calcareous or cartilaginous degeneration.

Dan M'Kenzie<sup>14</sup> speaks of the possibility of the round-cell sarcoma of the upper ethmoidal region and naso-pharyngeal fibroma being fundamentally akin, in spite of the fact that the former does not cease growth or undergo involution. Clinically they are similar, in that there is unrestrained local growth, the tendency to erode bone and to form connections as they spread, and in their readiness to bleed profusely.

The tumours are rare ; many specialists pass through a long active career without encountering one, while others see but few. Sir James Paget, quoted by Greville Macdonald,<sup>15</sup> had never seen a fresh specimen. Ingals,<sup>16</sup> in 6500 records of private cases, cites but five. From the number reported in continental literature, Coakley<sup>17</sup> thinks they must be more numerous in Europe, but Dighton<sup>18</sup> suggests that this view may be fallacious, owing to the readiness with which some countries report their cases. Lennox Browne<sup>19</sup> quotes Bosworth as having been able to find only forty recorded cases.

**Treatment.** — Operative removal is necessary to prevent continuation of the growth with all its disastrous possibilities. If the tumour is small, it may readily lend itself to removal with forceps ; or a periosteal elevator insinuated under the periosteum of the basi-sphenoid or the basi-occiput removes the mass along with the periosteum.

Large tumours may necessitate Moure's lateral rhinotomy, or splitting the palate to permit better access to the base.

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Preliminary laryngotomy may be advisable to prevent blood getting into the trachea. Occasionally, a wire loop may be passed round the mass and rapid removal be effected. The greater the extension of the growth, its vascularity and its basal attachment, the more dangerous the operation. Shock both from hæmorrhage, and possibly cardiac inhibition due to vagus irritation, are serious problems.

Chevalier Jackson<sup>20</sup> has operated on eight cases with preliminary ligation of the external carotid. Thomas Guthrie<sup>21</sup> could not make any approach to complete removal by cold wire or thermo-cautery snare in any of the severe cases which came under his observation.

Harmon Smith<sup>22</sup> advises, in some cases, the use of injections of monochloroacetic acid directly into the tumour. Lincoln and Voltolini<sup>23</sup> long since advocated the use of electrolysis followed by the galvano-cautery snare, and Delavan,<sup>24</sup> in 1911, has recalled this fact.

Diathermy and the use of radium will probably replace the extensive surgical procedures still in vogue. Daubney<sup>25</sup> records a case, considered inoperable from severe and repeated hæmorrhage, that was cured by one application of radium. G. B. New and others have had similar experiences.

**Case Reports.**—I present the clinical features of two cases, one showing how a large mass and two smaller ones were removed easily by snare and forceps, and with little or no anxiety; the other, a more formidable procedure, with a fatal outcome due largely, I think, to error of surgical judgment.

**CASE I.**—*Multiple Fibromata of the Naso-Pharynx.*—Boy, aged 17, born in England, was referred to me, in 1921, for removal of adenoids. The family history was unimportant. He had been operated on previously for adenoids but was not improved. The patient had a typical adenoid facies with overlapping of teeth and highly-arched palate. Rhinoscopy showed an engorgement of the mucosa on both inferior turbinates, and an excess of mucous secretion such as one sees in post-nasal obstruction. The middle and superior meatuses were clear, no structural abnormality was present, and there was no evidence of any sinus involvement. Transillumination was equally clear and X-ray examination was negative. No facial enlargement was present. The voice was toneless; soft palate bulged downward and forward, but was not parietic. The faucial tonsils were moderate in size, freely movable in their fossæ, soft to palpation, and pressure did not bring out unusual secretion. There were no

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enlarged cervical glands, nor any evidence of toxic activity of the tonsils.

The post-nasal mirror showed a bluish-grey, smooth, rounded tumour, almost filling the naso-pharynx. It was of moderately firm consistence and attached to the centre of the posterior pharyngeal wall in one place, but above, its attachment appeared to be at the outer side of the right choanal arch. A slight glimpse only could be gained of the left choanal space. The diagnosis of naso-pharyngeal fibromata was made. Operation was performed with general ether anaesthesia with the head slightly lower than the thorax, and with a pillow under the shoulders. As excessive hæmorrhage was to be feared, special efforts were made to combat it; 20 c.c. of normal horse serum were injected one half-hour before the operation. Two rubber catheters were passed through the nose and the ends drawn out of the mouth. To each end was attached a stout silk ligature. The catheters were then withdrawn through the nose so that the ligature could be thrown over the forehead and caught with artery forceps. The other ends, which were holding a gauze pad quadrilateral in shape, were also thrown over the forehead. Pulling on the ligatures held by the forceps would draw the gauze within each choanal arch; pressure would thus be better applied in the vault than if one pad was used, as this would press firmly only on the side through which it was originally passed.

A cold wire snare was next passed through the nose into the naso-pharynx, but I was unable to encircle the growth because of the attachment to the posterior pharyngeal wall. This was easily broken down and the wire firmly and slowly withdrawn. Bleeding became now rather free, so grasping the mass with a pair of post-nasal forceps and drawing the wire home, the forceps rapidly removed the tumour through the mouth. The hæmorrhage was copious but not alarming. Palpation revealed two other smaller masses attached to the base of the sphenoid, and it was then found that the attachment of the main tumour was to the internal pterygoid plate. A Löwenberg forceps rapidly removed the small masses and the post-nasal plug was immediately drawn into the vault. The bleeding stopped at once and did not return on removal of the plug after twenty-four hours. The naso-pharynx was much dilated by the pressure of the tumour, which did not produce any aural complaint, nor was deafness found before the operation. The patient made a rapid and uneventful recovery.

*Examination of the Tumour.*—The gross specimen consists of three tumours, the largest of which is almost the size of a flattened walnut; it is smooth in outline except at the base, about  $\frac{1}{2}$  inch in diameter, which looks rather like the surface of the tongue; just

## Naso-Pharyngeal Fibroma

behind this is a strand of tissue looking somewhat like a nerve. The tumour, as a whole, is whitish in colour, smooth in outline and fairly soft. On section, it is found to consist of a light pinkish material of a smooth consistence and even texture. The other masses are each the size of a large bean, have a pedicle, and are composed of the same kind of tissue as the larger mass. The large mass weighs 14 grams.

*Microscopic Findings.*—The tumour is made up of fairly loose fibrous tissue with a great number of thin-walled blood vessels. The surface is covered with columnar epithelium and shows some lymphocytic infiltration. There is no evidence of malignancy. Diagnosis—Polypoid fibroma. (Department of Pathology, University of Toronto.)

CASE II.—Boy, aged 13, Canadian, referred to me for advice regarding frequently recurring severe nasal hæmorrhage which occurred at several weeks' interval over a period of two or three years. Recently, the loss of blood had been very severe and on numerous occasions. Owing to the persistence and freedom of the bleeding it was thought he could not recover.

On examination, nasal obstruction was bilateral and complete. The soft palate was prominent, rounded and restricted in its movements. The naso-pharynx was filled with a mass described below. Owing to its size, I was unable to determine its attachments by either sight or palpation. A provisional diagnosis of malignancy was made and operative measures considered.

I undertook the decision as to the best method of treatment, with great mental reservation and fear. The seriousness of an operation involving the removal of a large tumour from the base of the skull was always in my mind. The operation was postponed, on one occasion, in order that I might assure myself that surgical measures leading to removal *en masse* was the correct procedure. I could not, however, arrive at any decision unless the patient was under an anæsthetic, when he could be more thoroughly studied. This was carried out under ether anæsthesia, skilfully administered. Owing both to the size and density of the mass, no conclusion could be reached from palpation of the pharynx. The finger could not be inserted far enough to identify even the chief attachment.

To gain more room, and in order to secure a direct view, the soft palate was split in the middle line, but it required the removal of some of the hard palate before one was able to secure a satisfactory examination. It was then found that the tumour was attached by a broad base to the upper part of the cervical aponeurosis. The attachment could be encircled by a probe but not by the finger. A constriction was present in the tumour mass leading to another

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large irregular fixed mass in the left choana which passed forward into the nose, pushing the septum, which from pressure was membranous only, tightly against the outer wall of the right nasal cavity. The decision had now to be made as to the advisability of attempting the removal of the growth. This seemed to be quite feasible by dividing the anterior constriction so as to separate the two main bodies. Hæmorrhage up to this time was slight and removed by suction. The patient's condition was good, and having in view the grave responsibility in leaving it alone, or trusting to measures still on trial, such as radium or X-ray, I decided to continue the surgical measures already begun. This was an error of judgment, as a continuation of the narrative shows. The anterior constriction was severed with scissors and knife, with seemingly comparatively little hæmorrhage, but on attempting to remove the nasal part of the mass, it was found very firmly attached in several areas. I succeeded however, in clearing the nose with heavy forceps and torsion. The bleeding was not troublesome, but I think it was, for this patient, too severe. The suction apparatus was very helpful but also deceptive. On examination, the nose, now free from the growth, showed the attachment of the tumour to have been on the outer nasal wall. The ethmoid, antrum, and sphenoid sinuses were unduly open to finger palpation. So little of the ethmoid remained, that I could palpate the cribriform area and the nasal floor of the frontal sinus. The anterior face of the sphenoid was almost entirely destroyed.

I was tempted now to desist and leave the main body in the naso-pharynx for further consideration, but the accessibility of the pedicle to surgical measures, and the natural desire to complete the operation, led to another error of judgment. On attempting to remove the mass, I found it impossible to get it away by torsion or snare, or by rocking it in the manner used by Stucky. Attempts to do so, and they were vigorous, failed. I was then forced to punch out bits with a large tonsil punch, and using curved scissors with traction, I ultimately removed the growth. This left an enormous dome, but the bleeding in the walls was not severe and was easily controlled by gauze packing. The patient had already been given saline injections owing to feeble heart action. The amount of blood lost was considerably more than I thought, and here, too, the suction apparatus, though useful, was deceptive. As the collapse became more severe, no attempt was made to close up the roof of the mouth. Furthermore, it was thought that the case was probably malignant, and the use of radium would be facilitated if the vault were more accessible. The patient was removed to the ward and transfused intravenously, but he died without regaining consciousness.

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*Examination of the Tumour.*—The gross specimen consists of two irregular masses of tissue which originally formed one mass about the size of a blood-orange, greyish white in colour, somewhat putty-like in consistence with occasional firmer areas. Here and there, fine spicules of bone are adherent. One part of the tumour seems to have a definite capsule, the other part is broken and torn up, and the covering cannot be made out. The cut surface shows numerous fine pin-point areas looking like blood vessels. All the spicules of bone seem to be on the external surface of the tumour, not on the internal.

*Microscopic Findings.*—The tumour is made up of loose connective tissue types of cell, and is rather œdematous. The cells are well differentiated. The tumour shows a large number of thin-walled blood vessels which are quite large in size. There are no mitotic figures present, and no evidence of malignancy. Diagnosis—œdematous fibroma. (Department of Pathology, University of Toronto.)

I am impressed with the thought that the shock, due to hæmorrhage, may not have been solely caused by the excessive loss of blood. What is the effect of the operation on the cardio-inhibitory fibres of the vagus? I intended showing charts exhibiting the effect on the blood pressure which is produced by severe crushing in the naso-pharynx of animals. Professor M'Leod of the Department of Physiology of Toronto University, to whom I applied for assistance, thought very deceptive information would be likely to follow, as animals vary so much in their response to vagus irritation, and the same might apply to human beings. For this reason no animal experimentation has been performed.

I trust that the recitation of a surgical catastrophe will at least emphasise the importance of cultivating the grace of humility. Sir Berkeley Moynihan,<sup>26</sup> in his Hunterian Lecture of the present year, says: "To review our own work is a very stern and salutary discipline. It will make clear the need to correct the impressions, often vague and sometimes very treacherous, which have been gained rather from the occasional dramatic occurrence, than from the tranquil observance of a daily and placid routine; it may confirm our faith in convictions that have slowly grown and strengthened almost imperceptibly; it will lead us to test again an opinion not quite so impregnable as we had thought. When those who are responsible for much of our modern surgical and medical literature will act for these truths, less ink will be spilled and more truth told."

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## CHRONIC HYPERPLASIA OF THE UPPER JAW: ITS RELATIONSHIP TO OTHER OSSEOUS TUMOURS AND TO OTOSCLEROSIS.\*

By DOUGLAS GUTHRIE, M.D., F.R.C.S.Ed.

CHRONIC hyperplasia of the upper jaw, a somewhat rare disease, appears to deserve more careful attention than it has hitherto received. It consists of an enlargement of the upper jaw on one side, due to the exuberant growth of cancellous bone. In the following brief study the subject may be considered under two headings:—

1. The relation of chronic hyperplasia to other osseous tumours of the upper jaw with which it may be confused.
2. The striking similarity of the histological appearances in hyperplasia and in otosclerosis.

**1. Chronic Hyperplasia of the Upper Jaw.**—Two cases of this nature have recently come under my notice:—

CASE I.—A girl, aged 16, presented a smooth, painless swelling of the left upper jaw, which was first noticed a year before I saw her. The enlargement affected, mainly, the lower part of the canine fossa. None of the teeth were carious. At first, the condition was regarded as a dental cyst, but a radiogram showed blurring of the left antrum, and no appearance to suggest dental cyst.

The swelling was exposed by an incision through the mucous membrane of the canine fossa, and a quantity of soft bone was gouged away. No antral cavity was discovered. Two years later the patient was well, with no recurrence.

CASE II.—The second patient was a boy, aged 4, in whom a swelling of the jaw had been present since birth.

The outer nasal wall was pushed inwards on the left side, and only a fine probe could be passed as far as the nasopharynx, where it could be felt with the finger. Epiphora was present, and the mother stated that the swelling of the cheek became red when the boy was chewing food.

\* A Paper read at the Summer Meeting of the Section of Laryngology, Royal Society of Medicine, Manchester, 15th June 1923.

## Douglas Guthrie

A dental impression, taken by Dr Gibbs, showed very well the thickening of the alveolar margin. A year ago a small quantity of bone was removed for microscopic examination. The child was quite well when seen recently, the swelling having remained unaltered.

The subject of hyperplasia of the upper jaw has received little attention in medical literature. In 1884, Christopher Heath devoted a chapter of his classical work on *Diseases of the Jaws* to hyperostosis, and wrote: "Those cases form a group of diseases of bone, of which we know very little as to either their etiology or pathology." Christopher Heath mentions the case of a woman of 35 whose right upper jaw had been the seat of a painless enlargement for ten years. He excised the jaw, which was greatly enlarged and converted into a uniform mass of cancellated bone (Fig. 1).

The specimen is now in the Museum of the Royal College of Surgeons of England. The antrum is reduced to the size of a hazel-nut and lies at the posterior part of the bone.

In the same Museum there is another specimen, particularly interesting, as it is an upper jaw excised by Lord Lister (Fig. 2). It is a dry specimen, and has been bisected to show the nature of the growth. The antrum is almost completely replaced by finely porous bone, but there is no encroachment on the orbit or nasal cavity.

In Charing Cross Hospital Museum there is a specimen which is figured in Sir Frank Colyer's book on *Dental Pathology*. It is a jaw excised from a patient, aged 19, who noticed the swelling of his cheek two years before operation. The swelling was hard and painless, and there were no dental abnormalities. The antrum is obliterated by the bony overgrowth and the whole bone is increased in volume.

In recent times, the most complete account of the condition has been supplied by Westmacott in his paper read, in 1913, at the International Medical Congress. He gave details of 8 cases—all patients, save one, were females. On one of the patients, a girl aged 19, both walls of the alveolus were thickened by vascular, soft, cancellous bone. The excess of bone was removed, and there was no recurrence three years later. In another case there was severe neuralgic pain, for which the patient sought relief, as well as for the increasing disfigurement. The maxilla, with the exception of the orbital plate, was excised.

Two illustrations in the American work by Scudder on

# Chronic Hyperplasia of the Upper Jaw

*Tumours of the Jaws* show the thickened alveolus and its rounded edge, with the teeth appearing as though they had been pegged in position.

**Diagnosis.**—It would thus appear that chronic hyperplasia of the upper jaw is a definite pathological entity, having no connection with syphilis, with tubercle, or with malignant disease. Maxillary antral suppuration, when present, is a secondary infection, and not the cause of the bony overgrowth. The disease has nothing in common with acromegaly, in which all the facial bones are enlarged, though otherwise unaltered.

Osteitis deformans (Paget's disease) affects the cranial vault but not the face or jaws.

The name "*Leontiasis ossea*," frequently misapplied to all osseous enlargements of the jaws, was originally intended by Virchow to denote "multiple exostoses of the bones of the face and head." A classical example of the condition was shown by Bickersteth, in 1866, before the Pathological Society of London. The patient was a man of 34, and the swelling of the face had been present for twenty years, and had gradually increased. The malar bones had become dense, globular masses, and the lower jaw was enormously thickened. All the bones of the head were involved, and the nose and mouth were almost obliterated by the bony masses.

Cases of a less advanced type of *leontiasis ossea* have been reported by various observers. Horsley gave details of five cases, and Bland Sutton recorded one, in which the left upper jaw, and subsequently the left lower jaw, were removed.

Those cases of *leontiasis* are mentioned here because it has been suggested, though without definite proof, that this disease represents an advanced stage of chronic hyperplasia of the upper jaw.

Mention may also be made of the strange anomaly of unilateral hypertrophy. It has been described in detail in the Edinburgh Hospital Reports by Mr D. M. Greig. Sometimes the bones alone are affected; sometimes, as in his case, the soft parts participate in the hypertrophy. Twenty per cent. of the patients are mentally defective, and Greig suggests that the disease is the result of meningitis or neuritis during intrauterine life. It is a hypertrophy of normal tissues, not a hyperplasia.

**Treatment.**—A word may be said regarding the treatment of chronic hyperplasia of the upper jaw. There can be little doubt that the maxilla has, in some such cases, been needlessly

## Douglas Guthrie

sacrificed. Doubtless a partial excision is necessary when pain is present or when the growth of bone has produced an unsightly deformity. In other cases, if the patient can be kept under occasional observation, no operation is required, and at a certain stage the growth becomes arrested. Retrogression has not been observed, nor is there any record in literature of the disease becoming malignant.

**Chronic Hyperplasia of the Jaw in its Relation to Otosclerosis.**—On examining the excellent sections of my cases, prepared by Dr James Dawson, the appearance was found to be very similar to otosclerosis.

The tissue (Fig. 3) consists of a network of new bone. The meshes of this network, irregular in size and form, are filled with a loose fibrous tissue with numerous capillaries, while at the periphery, closely applied to the bone, are several layers of osteoblasts busily engaged in laying down new bone. Very few osteoclasts are present. There is no evidence of inflammatory change, only a few scattered lymphocytes being observed.

Under high power (Fig. 4) there are seen more clearly the bony framework, the capillaries, and the osteoblasts which are becoming ossified to form the bone cells such as are seen scattered throughout the trabeculae.

Dr Albert Gray, who kindly examined the slides, agreed that the appearance strongly resembled otosclerosis, and notably recalled the sections of Case IV., described and illustrated in his book on *Otosclerosis*.

Mr G. J. Jenkins has recently sought to demonstrate a relationship between otosclerosis and osteitis deformans.

Deafness has not been noted in any of the recorded cases of hyperplasia of the upper jaw, but the histological resemblance is striking. Like otosclerosis, chronic hyperplasia of the upper jaw may be regarded as a biological variation which may appear in susceptible persons, and its inception may depend upon a variety of causes. It would be futile, in the present state of our knowledge, to pursue the analogy further, but it may be mentioned that in a recent paper James Dawson and J. W. Struthers have endeavoured to trace transition stages between fibrous osteitis (such as may result from irritation, e.g. bunion) and osteitis fibrosa. Possibly otosclerosis may be the result of the same factors which cause these diseases, by upsetting the normal processes of bone destruction and regeneration.



FIG. 1.

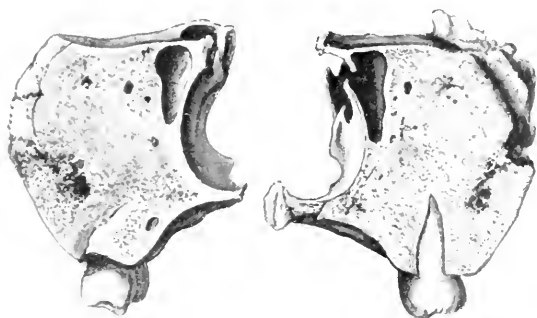


FIG. 2.



FIG. 3.

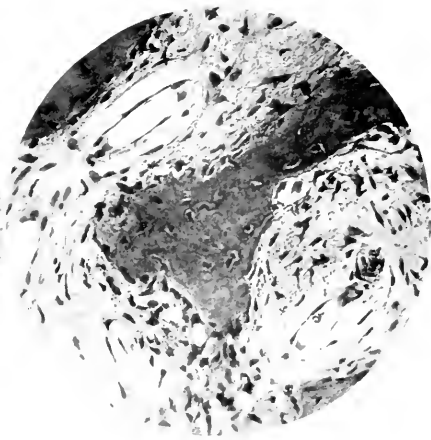


FIG. 4.



# Chronic Hyperplasia of the Upper Jaw

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## DESCRIPTION OF PLATE.

- FIG. 1.—Chronic Hyperplasia of Upper Jaw removed by Mr Christopher Heath. Museum Roy. Coll. of Surgeons, England, No. 2211A.
- FIG. 2.—Chronic Hyperplasia of Upper Jaw (bisected) removed by Lord Lister. Museum Roy. Coll. of Surgeons, England, No. 1360, 1.
- FIG. 3.—Section of bone from Case I. in text, showing network of new bone with fibrous tissue in the meshes.  $\times 50$ .
- FIG. 4.—Section from the same case showing osteoblasts depositing new bone on trabeculae.  $\times 350$ .

# STATISTICAL TABLES FOR THE YEAR 1922.

*From the Ear and Throat Department of the Royal Infirmary, Edinburgh :  
Dr A. Logan Turner, Surgeon-Consultant, Dr J. S. Fraser, F.R.C.S. Ed.,  
and Mr J. D. Lithgow, F.R.C.S. Ed., Senior Surgeons.*

By Mr J. M. GIBSON, F.R.C.S. Ed., Clinical Tutor, and  
Miss A. G. BROUGH, M.B., late Clinical Assistant.

SINCE 1907, the Statistical Tables from the Ear and Throat Department of the Royal Infirmary, Edinburgh, have been published annually in the *Journal of Laryngology and Otology*, with the exception of those dealing with the year 1907, which appeared in the *Edinburgh Medical Journal*, July 1908. During the whole of the period, 1907-21, the material which furnished the Statistics was derived from one of the two Sections which constituted the Department, namely, that in the charge of Dr A. Logan Turner.

Owing to the changes in the staff, following the retirement of the two senior surgeons at the end of 1921, and as the result of a closer co-operation between both Sections of the Department, the Statistical Tables for 1922 have been calculated upon the material coming under the observation of Dr J. S. Fraser and Mr J. D. Lithgow, the two senior surgeons now in charge. In consequence of this, the Statistics are based upon a larger number of cases than formerly, and their value is, therefore, correspondingly increased. It is proposed to continue the same arrangement in the future.

## AFFECTIONS OF THE NOSE (2280).

### I. The External Nose and Nasal Vestibule.

Nasal Deformity . . . . .	2
Fracture of Nose . . . . .	6
Injury to Nose . . . . .	19
Erysipelas of Nose . . . . .	1
Lupus of External Nose . . . . .	2
Gumma of External Nose . . . . .	1
Nævus of Nose . . . . .	1
Sebaceous Cyst of Nose . . . . .	1
Dermatitis of Vestibule . . . . .	34
Furuncle of Vestibule . . . . .	9
Abscess of Ala Nasi . . . . .	2
Papilloma of Vestibule . . . . .	3
Retention Cyst of Floor of Vestibule . . . . .	2



# Statistical Tables for the Year 1922

## II. The Nasal Cavities.

Deflection of Septum to Right . . . . .	390
"    "    Left . . . . .	323
Irregular Deflections of Septum . . . . .	250
Hæmatoma and Abscess of Septum . . . . .	5
Simple Ulcer of Septum . . . . .	1
Simple Perforation of Septum . . . . .	7
Bleeding Polypus of Septum . . . . .	1
Acute, Subacute, and Chronic Rhinitis . . . . .	150
Inferior Turbinal Enlargement . . . . .	622
Polypoidal Middle Turbinals and Nasal Polypi . . . . .	147
Purulent Rhinitis . . . . .	16
Fibrinous " . . . . .	2
Rhinitis Sicca . . . . .	20
Atrophic Rhinitis (Non-fœtid) . . . . .	37
"    "    (Fœtid) . . . . .	40
Lupus of Nasal Mucous Membrane . . . . .	11
Tertiary Syphilis of Nasal Cavity . . . . .	7
Epithelioma . . . . .	2
Nasal Neurosis and Asthma . . . . .	87
Essential Anosmia . . . . .	1
Epistaxis . . . . .	63
Foreign Bodies in Nose . . . . .	14
Rhinolith . . . . .	1

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## THE NASAL ACCESSORY SINUSES (327).

Chronic Antral Catarrh . . . . .	2
Acute Antral Suppuration . . . . .	17
Chronic "    " . . . . .	122
Acute Frontal Sinus Catarrh . . . . .	7
"    "    Suppuration . . . . .	22
Chronic "    "    " . . . . .	4
One with Orbital Abscess, one with Osteomyelitis and Leptomeningitis, and one with Frontal Lobe Abscess.	
Chronic Ethmoiditis—Catarrhal and Suppurative . . . . .	104
Chronic Sphenoidal Suppuration . . . . .	1
Chronic Ethmoidal and Antral Suppuration . . . . .	7
Acute Frontal "    " . . . . .	1
Chronic Frontal and Ethmoidal Suppuration . . . . .	3
Subacute Frontal, Ethmoidal and Maxillary Suppuration . . . . .	1
Chronic "    "    " . . . . .	3
Pansinusitis . . . . .	16
Naso-antral Polypus . . . . .	14
Dental Cyst . . . . .	1
Angioma of Ethmoid . . . . .	1
Malignant Disease of Antrum . . . . .	1

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Dacryocystitis . . . . .	10
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J. M. Gibson and Miss A. G. Brough

## DISEASES OF FAUCES, PHARYNX, AND NASO-PHARYNX (2732).

Bifid Uvula . . . . .	3
Injury to Soft Palate . . . . .	1
Acute Tonsillitis . . . . .	76
Peritonsillar Abscess . . . . .	52
Vincent's Angina . . . . .	7
Diphtheria . . . . .	5
Enlarged Tonsils and Adenoids . . . . .	2307
Enlargement and Œdema of Uvula . . . . .	15
Ulcer (Pneumococcal) of Tonsil . . . . .	2
Tubercle in Tonsil . . . . .	1
Secondary Syphilis of Fauces and Pharynx . . . . .	13
Tertiary " " " " . . . . .	22
Cyst of Tonsil . . . . .	1
Papilloma of Soft Palate . . . . .	2
Malignant Disease of Tonsil—Epithelioma . . . . .	4
" " " Sarcoma . . . . .	2
Epitheliomata of Soft Palate (including Pharynx) . . . . .	8
Post-diphtheritic Paralysis of Soft Palate . . . . .	6
Acute Pharyngitis . . . . .	21
Retropharyngeal Abscess . . . . .	4
Chronic Pharyngitis (including Granular Pharyngitis) . . . . .	99
Pharyngitis Sicca . . . . .	8
Keratosis Pharyngis . . . . .	2
Hypertrophy of Lingual Tonsil . . . . .	33
Lupus of Pharynx and Hard Palate . . . . .	2
Sensory Pharyngeal Neurosis . . . . .	13
Unilateral Congenital Atresia of Choanæ . . . . .	1
Tornwaldt's Bursa . . . . .	3
Cyst in Naso-pharynx . . . . .	1
Rhabdomyoma of Naso-pharynx . . . . .	1
Malignant Tumours of Naso-pharynx—Epithelioma . . . . .	1
" " " Sarcoma . . . . .	2
Foreign Bodies in Fauces, Pharynx, and Naso-pharynx . . . . .	14

## DISEASES OF MOUTH (22).

Hæmangioma of Lip . . . . .	1
Tongue Tie . . . . .	2
Superficial Glossitis . . . . .	2
Lupus of Tongue . . . . .	1
Tertiary Syphilis of Tongue, involving Palate . . . . .	4
Papilloma of Tongue . . . . .	1
Carcinoma of Tongue, involving Alveolus, and Palate . . . . .	2
Neurosis of Mouth . . . . .	1

# Statistical Tables for the Year 1922

Cleft Palate . . . . .	4
Periodontal Abscess . . . . .	1
Alveolar Sequestrum . . . . .	1
Papilloma of Alveolus . . . . .	2
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	22
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## AFFECTIONS OF THE LARYNX AND TRACHEA (153).

### I. Acute.

Acute Catarrhal Laryngitis . . . . .	18
Subacute „ „ . . . . .	3
Acute Œdematous Laryngitis . . . . .	1
Diphtheria of Larynx . . . . .	1
	<hr/>
	23
	<hr/>

### II. Chronic.

Chronic Catarrhal Laryngitis . . . . .	29
Laryngitis Sicca . . . . .	10
Vocal Nodules . . . . .	3
Pachydermia of Larynx . . . . .	3
Keratosis Laryngis . . . . .	1
Tubercle of Larynx . . . . .	16
Syphilis of Larynx . . . . .	12
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	74
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### III. Tumours.

Simple :—	
Papilloma . . . . .	3
Fibroma . . . . .	1
Malignant :—	
Intrinsic Carcinoma . . . . .	8
Extrinsic „ . . . . .	8
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### IV. Affections of Laryngeal Nerves.

Functional Aphonia . . . . .	15
Complete Paralysis of Right Vocal Cord . . . . .	2
„ „ Left Vocal Cord . . . . .	4
Sensory Laryngeal Neurosis . . . . .	4
Glottic Spasm . . . . .	1
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## V. Miscellaneous.

Infantile Epiglottitis . . . . .	2
Infantile Larynx . . . . .	1
Congenital Laryngeal Stridor . . . . .	2
Injury to Larynx . . . . .	1
Perichondritis of Larynx (cause unknown) . . . . .	1
Ankylosis of Left Arytenoid Cartilage . . . . .	1
Foreign Body in Larynx . . . . .	2
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## AFFECTIONS OF THE LARYNGEAL-PHARYNX AND ŒSOPHAGUS (41).

Stricture :—

(a) Simple (lower end of Œsophagus) . . . . .	1
(b) Syphilitic . . . . .	1
(c) Malignant—Cervical . . . . .	2
„ Thoracic . . . . .	10
	<hr/>
	12
Simple Ulcer of Œsophagus (Traumatic) . . . . .	1
Neurosis of Laryngeal-pharynx and Œsophagus . . . . .	3
Cardiospasm . . . . .	1
Foreign Bodies—Cervical . . . . .	14
„ Thoracic . . . . .	8
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	22
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	41
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## AFFECTIONS OF THE EAR (2992).

### I. The External Ear.

Accessory Auricle . . . . .	1
Injury to External Ear . . . . .	3
Injury to Tympanic Membrane . . . . .	3
Cerumen . . . . .	629
Furunculosis . . . . .	86
Otitis Externa Diffusa . . . . .	114
Exostosis . . . . .	1
Abscess of External Ear . . . . .	1
Erysipelas of Auricle . . . . .	2
Sebaceous Cyst behind Ear . . . . .	5
„ „ of Auricle . . . . .	4
Hæmatoma of Auricle . . . . .	2
Foreign Body in Ear . . . . .	12
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# Statistical Tables for the Year 1922

## II. The Middle Ear Cleft.

Eustachian Obstruction . . . . .	522
Acute Non-suppurative Otitis Media . . . . .	94
Chronic           "                  " . . . . .	74
Acute Suppurative Otitis Media :—	
Right . . . . .	60
Left . . . . .	44
Bilateral . . . . .	16
Chronic Suppurative Otitis Media :—	
Right . . . . .	249
Left . . . . .	159
Bilateral . . . . .	180
Sequelæ of Chronic Suppurative Otitis Media :—	
Right . . . . .	104
Left . . . . .	104
Bilateral . . . . .	104
Acute Middle Ear Suppuration with Mastoid Complication :—	
Right . . . . .	33
Left . . . . .	31
Bilateral . . . . .	3
Chronic Middle Ear Suppuration with Mastoid Complication :—	
Right . . . . .	31
Left . . . . .	35
Bilateral . . . . .	3
Hæmatotympanum following Head Injury . . . . .	1
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	1847

## III.

Otosclerosis . . . . .	58
Mixed Middle and Inner Ear Deafness . . . . .	38
	<hr/>
	96

## IV. Internal Ear Affections.

Congenital (including Deaf-mutism) . . . . .	6
Traumatic Deafness . . . . .	2
Occupational   " . . . . .	7
Functional       " . . . . .	5
Circumscribed Labyrinthitis . . . . .	7
Acute Manifest Purulent Labyrinthitis . . . . .	1
Chronic Latent   "       " . . . . .	4
Presbycusis . . . . .	39
Congenital Syphilis . . . . .	14
Acquired Syphilis . . . . .	4

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Nerve Deafness (due to Toxaemia)	.	.	.	.	.	1
„ „ (cause unknown)	.	.	.	.	.	95
Cerebello-pontine Tumour and Tumour of Eighth Nerve	.	.	.	.	.	1
						<hr/> 186

## INTRACRANIAL COMPLICATIONS OF SUPPURATIVE OTITIS MEDIA (24).

*Ten* cases complicating Acute Otitis Media Suppurativa:—

Perisinus Abscess (Left ear)	.	.	.	.	2
Sinus Thrombosis, (Right ear, 1 ; Left ear, 1)	.	.	.	.	2
Temporo-sphenoidal Abscess (Left ear)	.	.	.	.	2
Cerebellar Abscess (Left ear)	.	.	.	.	1
Purulent Meningitis (Left ear)	.	.	.	.	3
					<hr/> 10

Recoveries : 6.—2 cases of Temporo-sphenoidal Abscess.

2 „ Perisinus Abscess.

2 „ Sinus Thrombosis.

Deaths : 4.—3 „ Purulent Meningitis.

1 case of Cerebellar Abscess.

*Thirteen* cases complicating Chronic Otitis Media Suppurativa:—

Extra-dural Abscess (both with anterior perforations in M.T.)	.	.	.	.	.	2
Sinus Thrombosis and Perisinus Abscess	.	.	.	.	.	1
Sinus Thrombosis, Perisinus Abscess, and Lepto-meningitis	.	.	.	.	.	2
Temporo-sphenoidal Abscess	.	.	.	.	.	4
Cerebellar Abscess and Temporo-sphenoidal Abscess	.	.	.	.	.	1
Labyrinthitis and Meningitis	.	.	.	.	.	3
Labyrinthitis and Extradural Abscess (Posterior Fossa)	.	.	.	.	.	1
						<hr/> 14

Recoveries : 6.—2 cases of Temporo-sphenoidal Abscess.

2 „ Extra-dural Abscess.

1 case of Sinus Thrombosis with Ligature of Jugular.

1 case of Labyrinthitis with Extradural Abscess.

Deaths : 8.—3 cases of Labyrinthitis with Meningitis.

2 „ Temporo-sphenoidal Abscess.

1 case of Cerebellar and Temporo-sphenoidal Abscess.

1 case of Sinus Thrombosis, Perisinus Abscess, and Lepto-meningitis.

# Statistical Tables for the Year 1922

## MISCELLANEOUS CASES (307).

These include goitre, skin diseases, headaches of unknown origin, eye cases, and cases sent from other Departments for examination, etc. . . . .

307

## TABLE OF OPERATIONS.

### The Nose.

Broken Nose rectified . . . . .	5
Plastic Operation . . . . .	1
Removal of Papilloma from Nasal Vestibule . . . . .	2
Radium inserted into Nose . . . . .	2
Nasal Cautery . . . . .	21
Turbinotomy . . . . .	170
Nasal Polypi . . . . .	106
Abscess and Hæmatoma of Septum . . . . .	1
Septal Resection . . . . .	246
Nasal Sequestrum . . . . .	2
Curetting for Lupus . . . . .	2
Dental Cyst (projecting into floor of nose) . . . . .	1
West's Operation on Tear Sac . . . . .	5
	<hr/>
	<u>564</u>

### Nasal Accessory Sinuses.

Proof Puncture of Maxillary Antrum . . . . .	171
Intranasal Operation on Antrum . . . . .	10
Radical Operation on Antrum . . . . .	67
Frontal Sinus—Radical . . . . .	6
„ Opening and Draining . . . . .	1
„ Intranasal . . . . .	1
	<hr/>
	8
Sluder Operation : Opening and draining Ethmoid and Sphenoid . . . . .	58
Intranasal Operation on Sphenoid . . . . .	3
	<hr/>
	<u>317</u>

### Mouth and Pharynx.

Tonsils and Adenoids . . . . .	1640
Tonsils dissected out . . . . .	67
Peritonsillar Abscess opened . . . . .	59
Retro-pharyngeal Abscess opened . . . . .	1
Papilloma of Gum . . . . .	2
Radium applied—Sarcoma of Tonsil . . . . .	1
„ Naso-pharynx . . . . .	2
	<hr/>
	3
	<hr/>
	<u>1772</u>

# J. M. Gibson and Miss A. G. Brough

## Larynx, Trachea, and Œsophagus.

Direct Laryngoscopy for Examination and Laryngeal Swabs . . . . .	63
Suspension Laryngoscopy . . . . .	18
Œsophagoscopy :—	
Examination . . . . .	38
Removal of Foreign Bodies—Cervical Region . . . . .	14
„         „         Thoracic „ . . . . .	8
„         „         (not stated) . . . . .	3
	<hr/> 63
Bronchoscopy . . . . .	1
Tracheotomy . . . . .	2
Thyrotomy (for Epithelioma of Vocal Cord) . . . . .	4
	<hr/> 151

## The Ear.

Accessory Auricle . . . . .	1
Sebaceous Cyst of Auricle . . . . .	3
Furunculosis opened . . . . .	6
Paracentesis . . . . .	46
Aural Polypi . . . . .	33
Schwartz's Operation . . . . .	66
Modified Radical Operation . . . . .	21
Radical Mastoid Operation . . . . .	84
Plastic Operation . . . . .	5
Labyrinthotomy . . . . .	3
Intracranial—Extra-dural Abscess . . . . .	5
„         Sigmoid Sinus and Jugular Ligation . . . . .	3
„         Cerebellar Abscess . . . . .	1
„         Translabyrinthine Drainage . . . . .	3
„         Temporo-sphenoidal Abscess . . . . .	7
	<hr/> 19
	<hr/> 287

## Miscellaneous.

Abscess of Neck . . . . .	5
Injection of Alcohol for Neuralgia (Maxillary Division 5th C.N.) . . . . .	1
Diathermy—Epithelioma . . . . .	6
„         Lupus . . . . .	6
„         Sarcoma . . . . .	1
	<hr/> 13
	<hr/> 19

## Anæsthetics Administered.

Ethyl Chloride . . . . .	1609
Chloroform and Ether . . . . .	441
Local Anæsthetics . . . . .	642
	<hr/> 2692
Number of new patients attending the Departments . . . . .	5435



## SOCIETIES' PROCEEDINGS

### ROYAL SOCIETY OF MEDICINE—SECTION OF LARYNGOLOGY

*President*—MR CHARLES A. PARKER, F.R.C.S.Ed.

FIFTH ANNUAL SUMMER MEETING

**Manchester, June 15 and 16, 1923.**

**Chronic Hyperplasia of the Upper Jaw: Its Relationship to Other Osseous Tumours and to Otosclerosis**—DOUGLAS GUTHRIE, M.D. (The paper is published in the *Journal of Laryngology and Otology*, November 1923, Vol. xxxviii., No. 11, p. 575.)

#### DISCUSSION.

Mr LAYTON said that the disease occurred in the chimpanzee. He considered it was a very interesting subject and hoped Dr Guthrie would continue his investigations. In his (Mr Layton's) opinion, the causes of hypertrophy of the upper jaw particularly required investigation. He would like to hear Dr Guthrie's views as to the possibility of some microbic infection being the original cause.

Mr F. H. WESTMACOTT said he had been interested in these cases for a considerable time, and thought the point which required special investigation in the clinical aspect of these cases—in differentiation from other diseases of the bone of the superior maxilla—was the swelling in the canine fossa; in other diseases it encroached upon the orbit and the nose. He (the speaker) had not seen any case which was not limited by the orbital plate; it never invaded the internal wall. It always affected the antrum.

Dr GUTHRIE (in reply) said that with regard to Mr Layton's suggestion of microbic infection causing the hyperplasia, the microscopic appearances gave no support to such a view of the etiology. As to the question of carious teeth—the study of literature would rather suggest that dental caries was rare, and in the specimens which he showed there was no caries. Regarding Mr Layton's reference to nodular growth in the upper jaw of a chimpanzee, he (the speaker) thought that this was probably a case of "osteitis fibrosa" (see paper, by Knaggs, in current number of *British Journal of Surgery*). Mr Westmacott's suggestion as to the transition from this disease to sarcoma was very interesting. In the case of the kidney, the possibility of the transition between adenoma and sarcoma had been raised by Mr John Fraser, of Edinburgh.

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### Some Clinical Observations on the Lingual Tonsil—

J. ARNOLD JONES, O.B.E., F.R.C.S.Ed. (The paper is published *in extenso* in the *Journal of Laryngology and Otology*, September 1923, Vol. xxxviii., No. 9, p. 465.)

#### DISCUSSION.

Mr C. A. PARKER (President) stated that, at one time, he had made a good many observations as to the possible connection between abnormalities of the lingual tonsil and the various symptoms sometimes attributed to it, and he had come to the conclusion that, on the one hand, there might be considerable changes in the tonsil without any symptoms whatever, and, on the other hand, there might be many symptoms without any changes being present. It was perfectly true that relief of symptoms might be obtained by cauterisation of the lingual tonsil, but the same relief followed cauterisation of the posterior wall or lateral bands of the pharynx, or the application of any form of counter-irritation to any part of the pharynx. He did not think the lingual tonsil was responsible for the symptoms described.

Dr WILLIAM HILL said that, having seen a number of these cases with X-ray reports, he had never found bismuth remaining behind in the deep pharynx, a fact which showed that there was no obstruction to swallowing. Mr Jones had exhibited X-ray plates with bismuth in the deep pharynx, and although he would not say his own researches were exhaustive, Mr Jones had found what he (the speaker) had not discovered. In his (Dr Hill's) opinion, it was not advisable to rely too much upon the radiographer's report on the œsophagus.

Mr M. VLASTO said that a good many of the cases which Dr Jones had reported had probably no organic basis. The term "dysphagia" was used indiscriminately to denote difficulty or pain on swallowing. This had often given rise to misunderstanding. He attributed more importance—as an expression of local affection of the faucial region—to pain produced by a dry swallow than to that produced by the swallowing of food.

Dr P. WATSON-WILLIAMS said that in his experience the lingual tonsil was very seldom responsible for pathological symptoms. Of course it did participate in inflammatory conditions of the throat, and it might be the seat of rheumatic or septic infection, abscess, etc., but such cases were few and far between. He had seen cases of most extraordinary hypertrophy of the lingual tonsil in which there had been an incessant cough; as the patients failed to get relief, he had felt it necessary to operate and remove the hypertrophy. He did not think he had cauterised the lingual tonsil for twelve years at least, though many years previously he had frequently attributed symptoms to the lingual tonsil, and used the cautery, as he now believed, unnecessarily. He took the opportunity of explaining definitely why he could not accept the lingual tonsil as being the essential cause of all the symptoms described by Mr Arnold Jones.

Sir WILLIAM MILLIGAN said that he had taken a particular interest in the lingual tonsil. Although he was indebted to Mr Jones for raising the point, which was worth discussing, he (Sir William) would say at once that, during the whole of his professional career, he had never been able

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to associate more than one or two cases of enlarged lingual tonsil with any definite clinical condition. He thought the symptoms described were purely nervous. They occurred, as a rule, in highly excitable women as a local expression of a general nervous condition. He thought there was considerable risk in surgical interference with the lingual tonsil; cases had been recorded in which very severe and dangerous hæmorrhage had occurred. At the same time, one would take risks if one could definitely associate clinical symptoms with pathological conditions. So far as his experience went, the lingual tonsil was a very harmless organ.

Mr TILLEY said he also thought that the symptoms described as the result of enlargement of the lingual tonsil were of nervous origin. Mr Lennox Browne—the chief upholder of the significance of varicose veins at the base of the tongue—mentioned spasmodic wry-neck and paralysis of the deltoid as symptoms of the condition. He (Mr Tilley) had seen several cases in which cauterisation of the lingual tonsil had failed to cure local discomfort, so that he came to the conclusion that any improvement was due to imagination. That opinion was expressed twenty-five years ago. Probably several of those present would remember the very sharp controversy which occurred about that time. He (the speaker) could not bring himself to believe that so many laryngologists could have overlooked the significance of this region, had there been truth in the theory. It was quite uncommon to find these symptoms in men, whereas they were frequently present in women who led sedentary or unhealthy lives, and more particularly at the time of the menopause. He thought these facts pointed to the symptoms being of nervous origin, rather than due to any local lesion in the lingual tonsil. As to the relief obtained from cauterisation or local applications of pigments, he thought patients would get equal relief if they were applied to the back of the neck.

Mr H. J. BANKS-DAVIS said that the majority of students nowadays seemed under the impression that it was useless to enucleate the tonsil with the guillotine unless the lingual prolongation was enucleated at the same time, and they were taught that unless the tonsil was removed by dissection, the patients would not get the relief required. This was quite untrue. He was under the impression that the lingual tonsil was a mucous gland, and that, in consequence, its function differed from that of the faucial tonsil.

Mr W. S. SYME said he agreed that one did not generally look to the lingual tonsil as a cause in cases of difficulty of swallowing, etc. At the same time, he was quite convinced that he had seen a few cases in which an enlarged lingual tonsil had caused symptoms of spasmodic cough and difficulty in swallowing, and in which the removal of the enlargement had resulted in relief of the symptoms.

Mr ARNOLD JONES (in reply) said he was glad that his paper had, at any rate, brought about a discussion. He believed he had been misunderstood, because he did not contend that it was necessarily the presence of an enlarged lingual tonsil which caused the symptoms, but that it was something which occurred in that area analogous to what occurred in the "sensitive areas" of the nose in spasmodic rhinitis. In none of his cases had he met with sufficient hypertrophy of the lingual tonsil to justify removal. He maintained that cauterisation of the lingual tonsil area

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undoubtedly brought relief, and if such a simple measure could produce absolute comfort in cases of spasmodic cough, and in some cases of dysphagia, he did not see why it should not be more widely used. The position he had taken up in his paper was, that this area had been overlooked. He thought that in these days of high grade surgery a small region like this, which offered no opportunities for heroic operations, was likely to escape notice. He (Mr Jones) thought it called for more attention than it apparently received at the present time.

**The Treatment of Large Foreign Bodies Impacted in the Gullet**—D. R. PATERSON, M.D. (The paper is published *in extenso* in the *Journal of Laryngology and Otology*, October 1923, Vol. xxxviii., No. 10, p. 513.)

### DISCUSSION.

Sir WILLIAM MILLIGAN said that the removal of some foreign bodies presented extraordinary difficulties, and he considered that if the foreign body was in the respiratory passage, there was every reason for urgency. If it was in the œsophagus, however, one could take one's time, within reasonable limits. He was glad to hear Dr Paterson lay stress upon the value of dilating the œsophagus during examination. He thought this was of enormous importance, and added materially to the ease and safety with which one could remove the foreign body. There were some foreign bodies, for instance safety-pins, which were difficult to remove, since they were liable to tear the walls of the œsophagus. If open and with the point upwards, a problem presented itself which demanded careful consideration. The question arose as to whether it would not be better, after having located the pin by means of X-rays, and also by the use of the œsophagoscope, to perform an external operation at once. Everyone who had had experience of these cases knew how difficult it was to prevent the point of the pin lacerating the wall, and once the wall was lacerated—even a minute abrasion—there was the risk of septic infection. Therefore, he (Sir William) was of opinion that endoscopists were neglecting to some extent the value of the external operation. It was true that they could remove *almost* every foreign body *per vias naturales*, but not *every* foreign body could be so removed; in these exceptional cases, although they might be successful in removing the foreign body, they certainly subjected their patients to a great amount of risk in their attempts.

He showed a photograph of a laceration of the œsophagus caused by a sharp pointed bone—which had been impacted in the gullet for several days. The patient was vomiting small quantities of blood, and before anything could be done, a severe hæmorrhage occurred and death followed. He also referred to the case of a girl, who was said to have vomited a pint of blood the day before she was seen. There was a history that she had swallowed a foreign body (a bone), and on examination a small granulation was seen on the posterior wall of the œsophagus, opposite the arch of the aorta. He (the speaker) had decided to leave things alone, and the patient had been put back to bed. The following day the patient had another violent hæmorrhage and died, and, at autopsy, a bone which had perforated the aorta had been found immediately under the granulation. In

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that case there had been unnecessary delay in sending the patient to hospital. He (Sir William) thought that all foreign bodies which were jagged, pointed and sharp in any way, should be removed immediately, simply because the movement of the œsophagus tended to produce laceration and perforation. Another important point was that, in many cases, the foreign body (for instance a large piece of bone) so filled the œsophagus that one could see no lumen at all. In those conditions he (the speaker) thought they ought to make more use of hooks—not only one hook, but two hooks—one on either side of the foreign body, so as to get it sufficiently dislodged to be able to pass a pair of forceps round or over it.

Dr WILLIAM HILL said that most foreign bodies with jagged points were not in the gullet at all, but in the deep pharynx, and the sooner they were removed the better. One must never forget that these foreign bodies perforated very quickly, and it might be advisable to resort to the external operation. Familiarity with the operation made one more ready to embark upon it, and he (Dr Hill) thought this was a much safer plan than devoting, say, three-quarters of an hour to trying to turn a foreign body with a hook. He agreed with Sir William Milligan that, with the constant movement of the gullet, the jagged point tended to go deeper and deeper into the tissues and to produce mediastinitis, which was nearly always fatal.

Mr T. B. LAYTON, referring to Dr Paterson's remarks on the importance of careful observation before attempting to remove a foreign body, asked how long Dr Paterson thought it was justifiable to wait before attempting removal.

Mr F. H. WESTMACOTT said that in a large number of cases endoscopists were called upon to remove small dentures from the lower œsophagus. He (the speaker) thought they should institute a propaganda against the manufacture of these small dentures, as they were the cause of a considerable amount of trouble and danger. Dentures ought to be made to cover completely the whole of the palate. With regard to Mr Layton's question as to whether one ought to delay the removal of a foreign body or remove it at once, the two sides of the question had already been summarised by Sir William Milligan. He (Mr Westmacott) thought that in all cases one ought not to neglect the call to remove a foreign body, even although it might not be found in the suspected situation when the examination was undertaken. Copper coins ought to be attacked immediately, as in a few hours they corroded the wall of the œsophagus.

Mr W. G. HOWARTH said that, in his experience, large solid pieces of bone were the most dangerous foreign bodies, because of their jagged nature, and also because they were extraordinarily septic, and it was in cases of this nature that the possibility of external operation was most urgent. The external operation was comparatively easy in the upper part of the food passage, but what was to be done when the body was impacted at the level of the aorta? Was one to approach it from the back, or was it better to adopt the anterior method by taking out a rib and displacing the heart? There were advantages in both methods: certainly the frontal approach gave a very good view, and drainage could be satisfactorily arranged for.

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Mr E. MUSGRAVE WOODMAN said he agreed with Sir William Milligan and Dr Hill on the question of external operation. The operation which Mr Howarth had mentioned was comparatively easy, but it was not free from danger. The œsophageal wall was composed of soft tissue and had no serous coat.

Mr H. SMURTHWAITE said that in the case of a child, said to have swallowed a foreign body, the statement of the mother should not always be accepted. He (the speaker) had shown at the last Meeting of the Section, the case of a child, aged six months, who had swallowed the whistle from a rubber toy, and who had been seen by a surgeon three weeks previously. The child developed difficult breathing, and was sent into hospital. He (Mr Smurthwaite) had located the foreign body lying at the level of the tracheal bifurcation. Although it could easily be seen through the bronchoscope, it could not be removed—all his forceps being too large to pass down so small a tube—but it was ultimately successfully removed with a hook which he specially designed for the purpose. He certainly thought blunt hooks ought to be used in selected cases.

Dr PATERSON (in reply) said that the discussion had brought out what he wanted to know, and he was glad that his own opinion had been endorsed. He had been pleased to hear Mr Howarth's remarks with regard to external operation. He (Dr Paterson) had only seen the operation by an external route carried out once, and that was for a foreign body which had been impacted from fifteen to sixteen years in the lower part of the gullet, just behind the heart. The question was, whether something ought to be done at once to save the patient's life, and a colleague of his undertook the operation: it was found—what one had suspected from the examination—that there were such dense adhesions that the safest policy was to leave the foreign body alone. In this case he was impressed by the readiness with which the foreign body could be approached at such a low level.

**Diseases of the Thyroid Gland in their Relation to Laryngology** — F. HOLT DIGGLE, F.R.C.S. (The paper is published *in extenso* in the *Journal of Laryngology and Otology*, October 1923, Vol. xxxviii., No. 10, p. 522).

### DISCUSSION.

Mr HERBERT TILLEY said he wished to relate two cases of great interest. One was that of a female with left vocal cord paresis, which he (Mr Tilley) thought was due to a thyroid tumour behind the sternum. Breathing was difficult, and the patient was hoarse. The difficult breathing was caused by pressure on the trachea, and the hoarseness by paresis of the left abductor. He (the speaker) sent the patient for operation to Mr James Berry, who removed from underneath the sternum a very large dermoid cyst. In this case the left vocal cord remained paralysed. He (Mr Tilley) did not know what was the experience of members as regards this class of case, but he thought that when once recurrent paralysis of the vocal cord was definitely established, one very rarely found recovery from the paralysis after operation. The second case had occurred within

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the last three weeks. On examination of the larynx, the glottis could scarcely be seen at all. On operation by Mr Trotter, a simple tumour of thyroid tissue was found underneath the thyroid cartilage and invading the ventricle. It was necessary to remove the greater part of the thyroid cartilage in order to remove the tumour, and the patient made a good recovery, though great anxiety was caused for the first forty-eight hours by severe intralaryngeal swelling. It was the only case of this kind he had known, in which an extension of thyroid gland had invaded the larynx.

Mr H. SMURTHWAITE said that, during the last few years, he had had the opportunity of seeing a large number of thyroid cases, and had examined each larynx to see if there was any paralysis before and after operation. He had not come across a genuine paralysis of the cords from simple thyroid enlargement.

Mr DIGGLE (in reply) said that, with regard to Mr Tilley's remark about recovery after paralysis of the vocal cords, he (the speaker) was of the opinion that if the paralysis had existed longer than nine months, there was little chance of recovery. As regards Mr Tilley's last remark about the removal of the thyroid, he thought that it had been shown that it was not sufficient merely to remove the isthmus of the thyroid.

**Evolution of the Nasal Cavities and Sinuses in relation to Function**—J. F. O'MALLEY, F.R.C.S. (The paper will appear in a future number of the *Journal of Laryngology and Otology*.)

**A Clinical Note on the After-treatment of Empyema of the Maxillary Antrum (Denker's Operation)**—D. LINDLEY SEWELL, M.B.

## ABSTRACT.

Mr SEWELL said that he believed Denker's operation to be the most efficient because of the facilities which it offered for the complete inspection of the antral cavity. He did not pack the cavity after completion of the operation, but he held in position the mucous membrane flap from the antro-nasal wall by means of a strip of ribbon gauze. This was removed on the fourth day, and in the majority of cases no further packing was employed, nor was the antral cavity irrigated. Mr Sewell regarded irrigation as impeding rather than helping the recovery of the lining mucous membrane of the antrum and considered that it should be employed only in the minority of cases—in those in which recovery was slow. He had found solutions of silver nitrate very useful in the treatment of indolent cases.

Sir WILLIAM MILLIGAN said that it was his custom to perform the Denker's operation. The lines of treatment had been sketched out very well by Mr Sewell. There were two points before the Section, viz.: (1) Whether irrigation treatment should be carried out after operation, or not; (2) the method of dealing with the flap. The only question he would like to ask Mr Sewell was in connection with cases in which a concomitant ethmoidal affection was present, which frequently kept up a certain amount

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of intranasal discharge. He (the speaker) did not allow the antrum to be irrigated for ten days. He thought it essential that the buccal opening should be allowed to heal at once. He never packed the antrum.

Mr BANKS-DAVIS said they were all indebted to Mr Sewell for his interesting and practical paper. He was very interested in the fact that he did not irrigate afterwards, as he (the speaker) adopted that method himself. Had Mr Sewell any special means of dealing with the crusts which formed in the nose after operation, and were often so distressing to the patient?

Mr T. B. LAYTON said that since he paid a visit a few years ago to see Sir William Milligan operate, he had never sewn up the buccal wound, and his patients seemed to have far less swelling of the face, and the wound seemed to heal up quicker. He was very interested to learn that Mr Sewell opened up the wound four days later, and removed the packing. He had always taught his patients to wash out the maxillary antrum after operation, and for that reason removed a bit of the inferior turbinal, because he had had a case where he had not done so, and found it difficult to teach the patient to pass the cannula afterwards. He had come to the conclusion that the question of washing or not, was not so important as the solution used, and that physiological saline was a better lotion for the nose than any antiseptic lotion. He doubted if it were possible to put an antiseptic into the nose which had the slightest effect on the micro-organisms, unless it was so strong that it did harm to the mucous membrane. He found hypotonic solutions irritating to the nose. Hypertonic solutions were less so, but he believed that physiological saline was better than either.

Mr J. F. O'MALLEY said he always made an opening under the anterior end of the turbinates. He never made a buccal opening, and never washed out the antrum. The only point in favour of washing out was that it had a very satisfying effect upon the patient.

Mr A. J. M. WRIGHT said he thought that the wound healed up much better without a buccal opening. With regard to washing out, he had never been able to discontinue it entirely. He still found there were cases of chronic antral suppuration in which one had to carry out post-operative washing out.

Dr DOUGAS GUTHRIE said that in a great many cases so severe a procedure as a Denker's operation was not required, provided a sufficient amount of the anterior wall of the canine fossa was removed in the more usual Caldwell-Luc operation. In the Canfield technique, the operation was practically a "Denker" performed intranasally. He suggested the use of an oily spray in the after-treatment to prevent the formation of crusts.

Mr GRAHAM BROWN said he thought there was more sinus trouble in Queensland than in this country. In a certain number of antral operations, the result was not satisfactory; there was some persistence of mucopurulent discharge. He (the speaker) thought the thing to aim at first was a good view of the antral cavity; and for this reason, during the last five years, he had been doing all his antral operations under local anæsthesia. By this method there was practically no bleeding. He did not remove any



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portion of the inferior turbinal. He did not think a flap was essential; he had tried it, and did not think much was gained by it. He packed the antrum with a rubber glove, which was removed within twelve hours; he began washing out on the fourth day, when he invariably found that the buccal wound had healed. For washing out, he used eusol solution (1 in 6), and followed that almost immediately with a lotion practically identical with Wright's solution. He persisted with the washing out, gradually decreasing the number of applications. He thought it was an essential procedure; it was a mistake to leave an antrum unirrigated. A point to consider was, that frequently the anterior ethmoidal cells were involved in the suppurative process, and these required attention.

Dr IRWIN MOORE said he never carried out any after-operation packing, nor did he suture the buccal incision. In most of his cases he operated by the intra-nasal route, which was, in his experience, satisfactory in the majority of cases: the chief point to aim at to ensure success, was to make the nasal opening as large as possible. He avoided washing out for four or five days, and then he invariably used an ordinary saline solution, and later, he found the best treatment was to wipe out the antrum occasionally with argyrol 25 per cent.

Mr SEWELL (in reply) said he did not make a practice of suturing the buccal wound, because he had never found any difficulty in the natural closing of the wound except in two cases. In the usual antral case he had never had any trouble about the closing of the wound. As regards the formation of crusts, these were very difficult to deal with, and what he found most efficacious was to leave in over-night a piece of gauze with vaseline, as carried out in the treatment of atrophic rhinitis. In certain cases where there is not only suppuration of the antrum, but extensive ethmoidal and frontal sinus disease, the great trouble was crusting. He thought Mr Guthrie had really described Canfield's operation. He (Mr Sewell) had only tried it on two occasions, and it seemed to him that the operation was merely Denker's carried out through the nose—that is to say, under more difficult conditions.

**Demonstration illustrating Certain Pathological and Surgical Points in the Treatment of Malignant Disease in the Upper Jaw**—E. MUSGRAVE WOODMAN, F.R.C.S.—Slides were shown demonstrating the microscopic appearances, under both low and high power, of the various types of malignant tumour found in this region. Attention was called to a particular type of tumour of a general acinous formation, in which characteristic cells were conspicuous by their vacuolation. These tumours had been diagnosed by Professor Shattock as malignant endotheliomata. Sections of a cross-section of a normal ethmoidal labyrinth were demonstrated, and the remarkable resemblance to the tumours mentioned above was pointed out. Two series of coloured photographs of operations were recorded, as illustrating the extensive growths which can now be dealt with successfully. The first depicted an extensive epitheliomatous ulcer below the eye, which necessitated the removal of the eyeball

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and exposed the dura mater at the base of the brain; the second showed an extensive growth in the antrum, which had perforated the skin of the face below and above the orbit. Photographs taken both before and after operation were exhibited.

Mr W. S. SYME said that he had several times operated on malignant growths of the upper jaw. In one case of sarcoma (upper jaw, sinuses and nose) in which he thought he would get the best view, he made the incision down the middle of the face and split the nose. In that way he was able to get into all the accessory cavities and remove the growth from the sinuses. Very little disfigurement occurred, and the patient lived a good many years. He (Mr Syme) considered that in dealing with these cases, one owed a great deal of the success to diathermy. He was not convinced as to the value of radium in these cases. He had seen great destruction caused by radium, and, though he did not know what the experience of others had been, he personally would be very chary in using it.

Mr G. WILKINSON asked Mr Woodman whether, in the case of rodent ulcer cases which had become epitheliomatous, he found it necessary to dissect the glands in the neck, or if it was usual for the glands to escape infection in this class of case.

Mr MUSGRAVE WOODMAN (in reply) said that he considered this work came well within the specialty, because general surgeons, without intimate knowledge of the anatomy of the air cells, were not in a position to eradicate malignant disease of the upper jaw. He agreed that the effect of radium was very destructive. One of his patients had a very extensive sarcoma of the jaw which was removed, and was followed by recurrence in the cheek. He (Mr Woodman) applied 150 mg. of radium, and a month later the whole of the front of the face fell out. In reply to Mr Wilkinson, he was of opinion that glands in the neck did not tend to become involved, but in all cases of epithelioma, whether the glands were obviously affected or not, they should be excised widely and completely on the same side of the neck.

**Sarcoma of the Left Tonsil**—Sir WILLIAM MILLIGAN, M.D.—Male, aged 57, with difficulty in swallowing for six months, loss of weight, anæmia, deafness in left ear; firm lobulated growth springing from the left tonsillar region, filling mouth and displacing soft palate: an enlarged cervical gland was freely movable.

Microscopic report: round-celled sarcoma. On 12th May 1923, insertion of radium tube 40 mg. On 26th May 1923, almost complete disappearance of growth; the general condition was improving.

Sir WILLIAM MILLIGAN (in reply to questions) said he had not done anything more than apply radium in order to demonstrate its very rapid and immediate effect. He intended to remove the rest of the tonsil by diathermy.

**Epithelioma of Soft Palate and Left Anterior Faucial Pillar**—Sir WILLIAM MILLIGAN, M.D.—Male, aged 59, with sore throat and otalgia of three months' duration. An ulcerated and

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vascular growth involved a portion of the soft palate, left anterior faucial pillar and posterior surface of the uvula: infiltration of the tissues, but no palpable glands.

Microscopic examination: epithelioma. 25th May 1920: diathermy under general anæsthesia. 2nd June 1923: complete freedom from all symptoms since June 1920. There was now a small nodule upon the posterior pharyngeal wall, with a hard and indurated base. No pain was complained of.

Mr W. S. SYME said that the whole question of diathermy was so extensive that one hesitated to say much. In this case there certainly appeared to be a recurrence, which one would be well advised to remove by diathermy. One difficulty he (the speaker) had found in connection with these cases was, that the scar formed was very firm, and that the jaws became firmly fixed together. He would like to know if others had had the same experience. In one of his cases operated upon by diathermy a year ago, there was a growth declared inoperable by ordinary methods—involving both upper and lower jaws, and a large mass of glands. No recurrence followed in the mouth. Several months later the glands atrophied to the size of the thumb or smaller, and became very hard and firm. They were removed and found to be fibrous. He wondered if others had seen these changes—which were evidently a process towards cure—taking place in the glands after removal of the primary growth by diathermy.

Sir WILLIAM MILLIGAN (in reply) said that there was a small recurrence on the posterior wall, which he intended to diathermise at once. He had observed fixation of the jaw after extensive diathermy, and did not know what to do in such cases except to advise exercise. With regard to the question of removal of the glands, when glands were present, he usually dissected them out by a block dissection.

## **Epithelioma of the Right Vocal Cord: Laryngo-fissure—**

Sir WILLIAM MILLIGAN, M.D.—Male, aged 62, was first seen 14th June 1915, complaining of loss of voice for twelve months. Examination showed a cauliflower growth occupying the posterior two-thirds of the right vocal cord, which was fixed. 20th June 1915: laryngo-fissure; cord removed; alar cartilage was not removed. Microscopical report: epithelioma. 6th June 1923: no symptoms beyond a husky voice.

**Laryngeal Growth (Tuberculoma)**—Sir WILLIAM MILLIGAN, M.D.—Male, aged 56, with progressive loss of voice for nine months and slight expectoration; no bacilli found; history of left-sided pleurisy and gradual loss of weight; an enlarged gland in neck.

Mr HERBERT TILLEY thought the case was one of chronic tuberculosis, first, from the clinical appearances of the larynx, and secondly, because the patient had a rapid pulse and looked a sick man. He suggested that the evening temperature should be taken for a week.

Mr A. J. M. WRIGHT said he was also of the opinion that this was a case of tuberculosis. It reminded him of a male patient, a somewhat older

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man than the case shown, with no definite signs of tuberculosis in the chest. He (the speaker) had performed a laryngo-fissure on the assumption that the case was malignant. The patient very rapidly went down hill and died shortly afterwards of pulmonary tuberculosis.

Mr H. J. BANKS-DAVIS said that the patient was referred to him as a case of laryngeal paralysis, considered by his physician as thoracic in origin. When he (Mr Banks-Davis) first saw the patient, there was some swelling of the left ventricular band in addition to the laryngeal paralysis. When he next saw him, there was no question as to the swelling. He again saw him a month ago, and the œdema had increased. At first, he thought it might be a case of malignant disease of the larynx, but now he considered it was tuberculosis. Whether there was any malignant disease in conjunction with it, it was impossible to tell. He would be very chary of doing anything to the larynx, unless a portion of the swelling was examined microscopically.

Mr W. S. SYME said he considered that the lesion was more extensive than one would expect to find with tubercle; the colour and appearance generally being more suggestive of malignancy than of tubercle. He advised that nothing should be done until a definite diagnosis had been made.

Sir WILLIAM MILLIGAN said he was of the opinion that it was a mixed infection—a chronic tuberculosis which had become malignant, because no tubercle bacilli had been found in the sputum. There were no clinical signs of tuberculosis of the lungs, and the patient had a sub-normal temperature. Again, there was a certain amount of fixation on that side, as noticed by Mr Syme—an amount not usual in a case of tuberculosis, and that suggested superadded malignancy. There was also very rapid loss of weight—much more than one would expect to see in tuberculosis. He thought there was also some superficial ulceration. He certainly did not propose to do a laryngo-fissure, but to remove the gland in the neck first, and have it microscoped. If it proved to be malignant, then he would remove a small portion of the growth by the direct method, have it microscoped, and be guided by the result. He thought it might prove to be a mixed infection.

*Postscript.*—A portion of tissue was removed and microscopically showed tuberculous disease without any evidence of superimposed malignancy.

**Tuberculous Growth in Left Naris** — Sir WILLIAM MILLIGAN, M.D., and D. LINDLEY SEWELL, M.B. — Female, aged 32, with gradual blocking of left nasal passage and widening of nasal bridge. Examination showed a papillomatous-looking mass springing from the region of the vestibule and anterior portion of nasal septum. Septal spur removed from left nasal passage three years previously. Has this possibly been a traumatic infection? The growth was removed and base seared with galvano-cautery point. Microscopic examination: tubercular growth with caseation.

# Royal Society of Medicine

**Orbital Cellulitis: Invasion of Frontal Sinus: Osteomyelitis of Frontal Bone**—Sir WILLIAM MILLIGAN, M.D., and FRANK WRIGLEY, M.D.—Male, aged 15, was first seen 18th April 1923, after two days' illness; left eye proptosed; conjunctiva injected and chemotic.

19th April: the left frontal sinus was considered normal; incision made through upper eyelid and pus evacuated; mixed streptococcal and staphylococcal infection. Marked œdema over frontal region supervened; left eye eviscerated; left frontal sinus opened—no pus found.

28th April: condition of patient serious; œdema spreading over forehead; three incisions made over scalp down to bone.

1st May: temperature high, rigidity of neck, Kernig's sign, right side.

4th May: high temperature, rapid pulse, œdema over whole of left side of frontal region. Copious discharge of pus from orbit.

5th May: operation (Sir William Milligan). Frontal sinus reopened and found full of pus and granulation tissue; outer table of skull removed over left frontal area; whole of wound painted with pure carbolic acid and left open; fomentations applied; gradual recovery from time of operation to date, the only drawback being the development of an abscess in the neck, which has now been drained.

Mr J. F. O'MALLEY said the case reminded him of a patient whom he had seen some years ago in a fever hospital. A diagnosis had already been made of frontal sinus disease, but on examination he (the speaker) had found pus in the ethmoidal region, and had come to the conclusion that the trouble had started in that region, and was due to the effect of changes in the mucous membrane induced by the scarlet fever.

Sir WILLIAM MILLIGAN (in reply) said that he understood from Mr Wrigley that there was no accessory sinus disease at all. He (Sir William) did not know the cause of the orbital cellulitis. The boy was very ill when he was sent to the infirmary. He (the speaker) opened the frontal sinus which he found infected, removed the outer table of the skull, and applied pure carbolic acid to the raw surfaces. The boy had made good progress, and he hoped would recover altogether. Examination of the pus showed a streptococcal infection.

*Postscript.*—23rd July 1923: the boy is now quite well.

**Sarcoma of Right Tonsil and Surrounding Faucial Region**—Sir WILLIAM MILLIGAN, M.D., and FRANK WRIGLEY, M.D.—Male, aged 34, with swelling in throat accompanied by slight attacks of spontaneous hæmorrhage. Ragged and ulcerated hyperæmic mass occupied right side of fauces, firm, fixed, and involving tonsil, pillars of fauces and adjacent area of tongue. Mass spreads half-way over oro-pharynx, and for some distance down the pharynx. No palpable glands.

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Large round-celled sarcoma. Tracheotomy and diathermy. 22nd December 1921: tracheotomy tube removed. 25th December 1921: referred to Radium Institute.

**Two Cases of Chronic Œdema of Orbit**—F. H. WESTMACOTT, C.B.E., F.R.C.S.—(1) Male, aged 53, with œdema of left eyelid since January 1921: condition stationary since March, 1921: no pain, no nasal discharge; accessory sinuses clear; fundi normal; diagnosis invited.

(2) Female, aged 42. Œdema of right eyelids commenced five years ago at inner canthus: no pain; sight not affected; pus in right middle meatus. November, 1921: Ethmoidal and sphenoidal sinuses opened. Pus was present. No opening found into the orbit from ethmoidal labyrinth. Swelling varies, but is less than in 1921. Wassermann negative; diagnosis invited.

Mr HERBERT TILLEY referred to a similar case, which he had shown to the Section in London some five or six years ago, of a male who had served in the South African War, and had had malaria several times. In this case the same condition was present, except that it was bilateral, and he concluded that there was some local affection of the lymphatics. He suggested a bacteriological examination of the lymphatic fluid from the œdematous area.

Mr A. J. M. WRIGHT said he had seen a similar condition in a girl, aged 14. She had a marked degree of conjunctivitis, and it seemed to him (the speaker) that this was a possible means of entry of the infection.

Sir WILLIAM MILLIGAN said that he also regarded the condition as a chronic lymphangitis. There was a history of injury. He (the speaker) had seen two very similar cases, in both of which there had been a history of injury—abrasion and infection. In both those cases, tissue had been removed and microscopically examined, and was found to be chronic lymphangitis. He considered that both of the cases now shown were of a similar nature, and suggested microscopical examination of a piece of the tissue.

Mr WESTMACOTT (in reply) said he had hoped to elicit more information. In the first case, the man had not only had a mosquito bite over twenty-three years ago, but was also knocked in the eye by a cricket ball, and it was quite probable, as Sir William Milligan had suggested, that there had been some chronic lymphangitis. The nasal sinuses in this case were free. With regard to treatment, he was very grateful for the suggestions made. He would have the fluid examined, and also a piece of the tissue.

**Sarcoma of Maxillary, Malar, and Frontal Bones**—F. H. WESTMACOTT, C.B.E., F.R.C.S.—Male, aged 37. Sarcoma of maxillary antrum involved the orbital plate, canine fossa, malar bone,

# Royal Society of Medicine

and external angle of frontal bone: excised on 13th September 1913, together with the ethmoidal labyrinth and opening up of sphenoidal cavity. Microscopic section showed round-celled sarcoma. No further symptoms until 23rd February, when the cheek bone became hardened and the eye proptosed, and there was pain in the first division of the fifth nerve. After application of radium, the pain subsided and prominence of the part receded.

Mr E. MUSGRAVE WOODMAN said this was a remarkable case, in which a very successful operation had been performed ten years ago, since when, the patient had remained apparently perfectly cured. Then, possibly from a neglected ethmoidal cell or from a small focus in the malar bone, recurrence occurred across the orbital bone and appeared below the eyelid. This was quite unlike round-celled sarcoma. It did not remain quiescent for ten years and then slowly reform. He thought Mr Westmacott, at the present time, need be in no anxiety about his patient. The eyelid was free from growth, and he advised excision of the eyeball and elimination of the growth. In a case of this kind, in which the palate was not involved, he suggested leaving a window in the palate through which the involved area could be from time to time inspected, or through which radium could be inserted at any period after the operation. The opening could be easily covered up by a dental plate.

Mr WESTMACOTT (in reply) said he was glad to have Mr Woodman's advice about this case, and would in future operations cut out a window in the palate.

**Extensive Osteomyelitis of Frontal Bone**—F. H. WESTMACOTT, C.B.E., F.R.C.S.—Male, aged 40, had, in March 1922, pain in right frontal sinus with purulent nasal discharge for several weeks. Turbinal resection and the ethmoidal intranasal operation on 29th April 1922. In October 1922, fluctuant swelling over whole frontal area.

Operation, 4th October 1922: Transverse frontal incision. Extensive cario-necrosis of outer and inner tables of frontal bone with dura mater exposed over area the size of a shilling. Both frontal sinuses opened to orbital margin and below it. Tube inserted in left sinus and inter-sinus septum removed. Recovery.

**Tuberculosis of the Larynx**—J. A. KNOWLES RENSHAW, M.D.—Male, aged 55, had had extensive tuberculosis for seven years. Secondary laryngeal tuberculosis appeared in 1919. Both vocal cords were affected throughout their length. There was much hyperplasia and congestion. Some ulceration took place over the left vocal process. Treated by vocal rest. Intratracheal injections of liq. iodi. and formalin sprays. The vocal cords resumed a normal outline. Slight congestion on the right side remains. The tuberculosis of the lung has been active throughout the treatment and still persists.

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**Double Abductor Paralysis**—A. A. SMALLEY, M.B.:—A male, aged 50, had, in February last, difficulty in breathing and hoarseness for two months; inspiratory stridor; cyanosis. Tracheotomy was considered: abductor paralysis almost complete; cords congested and rough; scars on soft palate; Wassermann positive. No evidence of other central or peripheral nervous lesion was found. He improved under treatment, but there is still injection of cords and abductor paralysis.

**Chronic Cellulitis of the Face**—G. E. ARCHER, M.B.—J. T. S., aged 26, had intranasal operation in 1920 (? attempted submucous resection), followed by œdema of the face. He was first seen in September 1922, with chronic cellulitis of the face with periodic exacerbation. Œdema never completely disappeared. Perforation of the septum, adhesions between right inferior turbinal and septum; no accessory sinus disease. Condition failed to yield to treatment, including autogenous vaccine.

In December 1922, patch of alopecia areata developed. February 1923, intranasal adhesions were severed. Facial massage and Faradism instituted. Since then the condition has slowly but distinctly improved.

**Case of ? Clinically Malignant Disease of the Left Pyriform Sinus**—F. HOLT DIGGLE, F.R.C.S.—Male, aged 54, early in 1922, noticed hoarseness and difficulty in swallowing. There was no improvement in spite of treatment. On 21st September 1922, the epiglottidean fold was found infiltrated and cedematous, with bulging of left wall of larynx preventing view of left cord. A mass of whitish granulations projected from left pyriform sinus to outer side of above swelling. Wassermann negative. Œdema, fatty degeneration of the heart, and chronic Bright's disease prevented operation.

On 18th October 1922: three radium tubes, each 1.5 millicuries, inserted into left pyriform sinus (direct method, local anæsthesia).

23rd January 1923: four tubes inserted, each 1.5 millicuries, under direct laryngoscopy. Since then two external applications of radium plates at intervals of six weeks.

17th May 1923: symptoms have disappeared. There is marked diminution of the swelling and a perfect view of the larynx is obtained. No limitation of movement of left vocal cord.

**Demonstrations** were given:—

By P. Watson-Williams, M.D., upon "A Method of Exploration of the Nasal Accessory Sinuses," and

By Irwin Moore, M.B., on "The Reduction or Destruction of Hypertrophied or Diseased Tonsils by Means of Caustic Soda and Slaked Lime" (London Paste).



# Ear

*In the X-ray Department.*—By J. M. W. Morison, M.B., on “Cardiospasm and other Diseases of the Œsophagus.”

By E. W. Twining, M.R.C.S., L.R.C.P., on “Pirie’s Method of Radiographing the Mastoid Cells.”

By C. C. Anderson, M.B., on “Deep X-ray Therapy in Laryngological Conditions”; and

By A. Burrows, M.D., on “Methods of Application of Radium.” (Cases shown.) (At the Radium Institute.)

## ABSTRACTS

### EAR.

*A Case of Pedunculated Exostosis of the External Auditory Meatus.*

VALTER DAHLSTRÖM. (*Acta Oto-laryngologica*, Vol. v., fasc 2.)

The patient was a woman 26 years of age. The bony growth measured 10 mm. by 8 mm., with a pedicle 2 mm. in diameter, and was easily removed from its attachment to the lower and posterior aspect of the wall about 1 cm. from the meatal opening. The writer remarks that, although these growths are usually regarded as exostoses, their clinical course and slow growth suggest that they should perhaps be regarded rather as osteomata. In the case which he reports there was nothing to explain the origin of the growth.

THOMAS GUTHRIE.

*The Significance of Retraction of the Tympanic Membrane.* Professor S. CITELLI. (*Revue de Laryngologie*, November 1922.)

The writer comments on the number of cases examined by him showing marked retraction of the tympanic membrane, and increased obliquity of the handle of the malleus, without any Eustachian obstruction, and with little or no impairment of hearing. Further, in a number of cases of chronic tubal obstruction, he has found considerable improvement of hearing after inflation of the middle ear, though the retraction of the membrane and of the malleus has persisted. Citelli believes that this tympanic retraction is always a sign of former long continued Eustachian obstruction, and that the malposition of the malleus is due to a permanent contraction of the tensor tympani muscle, with some shifting of the head of the malleus in relation to the malleo-incudal joint.

G. WILKINSON.

## Abstracts

### *Two Signs of Ankylosis of the Stapes.* E. ESCAT. (*Revue de Laryngologie*, October 1922.)

The first of these signs is a modification of the classical Gellé's test. It consists in getting the patient to observe the effect of Valsalva inflation of the tympanum on the perception of the sound from a high-pitched tuning-fork ( $a^3$ ) held in front of the auditory meatus. The sound is unaffected in cases of ankylosis of the stapes, but markedly diminished in loudness in other cases, provided the Eustachian tube is free.

Escat lays more stress on the second test, which he considers pathognomonic. A low-pitched tuning-fork is used. This is only slightly heard, or not perceived at all by air conduction, by the subject of ankylosis. When the butt of the fork is applied to the mastoid, a reflex contraction of the facial muscles of the same side, and particularly of the orbicularis palpebrarum is excited, with a shrinking movement of the head. The reflex is absent in the normal subject.

G. WILKINSON.

### *Circumscribed Suppuration in the Mastoid Process.* W. KÜMMEL. (*Acta Oto-Laryngologica*, Vol. v., fasc. 2.)

Kümmel reports three cases of acute mastoid disease in each of which there was an isolated group of suppurating air cells completely separate from the remaining cells, the latter being normal or showing only very slight changes. In all the cases the clinical signs and symptoms clearly indicated the presence of pus in the mastoid. At the operation, however, this at first appeared to be absent, and the focus of disease was found only after prolonged search—in one of the cases at a second operation.

It is interesting to enquire how an isolated group of cells can show advanced disease while the rest of the mastoid is almost normal. Kümmel believes that this may be explained by the observation of Wittmaack, that while the greater part of the air cells is developed from the antrum, some arise from the sinus tympani, and the two groups have no direct communication with one another. In the first two cases, and probably also in the third, the disease seems to have involved only cells developed from the sinus tympani, the cells of antral origin remaining free from disease.

The condition is one which may entail considerable risk for the patient, as the cells originating from the sinus tympani are sometimes in close apposition to the lateral sinus, and, the rest of the mastoid being apparently normal, are easily overlooked. In cases of this kind a characteristic feature is bulging of the posterior *inferior* portion of the tympanic membrane with a small perforation on its summit,

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while in ordinary cases of disease of the cells of antral origin the bulging usually involves the posterior *superior* quadrant.

In some cases of persistent suppuration after the radical operation for chronic disease, the explanation probably lies in disease of unopened "sinus tympani cells."

THOMAS GUTHRIE.

### *Hardness of Hearing in School Children.* F. LEEGAARD.

(*Acta Oto-Laryngologica*, Vol. v., fasc. 2.)

The author, who has held for two years the post of Aural Surgeon to the School Medical Service of Christiania, gives a detailed account of the organisation of his department, the methods of examination and the conditions found in the 7,700 children who have passed through his hands. His results show the necessity of a systematic examination of all pupils attending elementary schools, regardless of whether the teaching staff have noticed any defects or not, otherwise cases of serious loss of hearing will be overlooked. He considers it especially important that all pupils who, on account of their poor abilities, are marked for transfer to the mentally defective school, should be submitted to a hearing test, before transfer takes place. A considerable number of such children are really of average intelligence but more or less deaf, and should be transferred to a "hard of hearing" school. The paper is a long one, containing much statistical detail. It indicates the valuable nature of the work which has been carried out in Christiania since the year 1919.

THOMAS GUTHRIE.

### *Acute Otitis Media with Jugular Bulb Thrombosis.* E. WATSON

WILLIAMS. (*Brit. Med. Journ.*, 16th June 1923.)

In a case of double otitis media there were severe systemic symptoms, but no definite signs of mastoid involvement. The occurrence of a rigor, however, necessitated exploration, and a small collection of mucoid pus was found in the antrum. The upper part of the sinus was exposed and found to be healthy, containing fluid blood. Another rigor, three days later, led to exploration of the jugular vein which was normal. The sinus, however, now contained recent clot, and exposure downwards discovered a small perisinus abscess superficial to the sinus and close to the bulb. Recovery took place. The author thinks the bulb was probably infected through the floor of the middle ear.

T. RITCHIE RODGER.

## Abstracts

*The Indications for Operation in Labyrinthine Cases.* Dr GEORGES PORTMAN. (*Revue de Laryngologie*, February 1923, and Discussion of Paper, *Ibid.*, 30th November 1922.)

This communication was read and discussed at the Tenth International Congress of Otolaryngology in July 1922. The introducer summed up the indications for operation in a cautious and conservative manner. In the discussion which followed, an interesting pronouncement was made by F. H. Quix (Utrecht). He is of the opinion that most cases presenting Ménière's syndrome are the subjects of localised increased intracranial pressure in the posterior fossa, and that if any operation is performed for the relief of unbearable vertigo, it should be a decompression trephining behind the mastoid. Dr Aboulker stated that he had performed this operation in three cases with complete and immediate relief of the vertigo.

G. WILKINSON.

*Case of Tumour of the Cerebellum that gave Negative Results to Tests of the Labyrinth and Labyrinthine Tracts.* Dr ROSENBLUTH. (*Laryngoscope*, Vol. xxxiii., No. 4.)

A case of tumour of the cerebellum in a boy aged 10 is reported. The onset was acute, and the symptoms noted were (1) falling to the right and backward; (2) slow pulse and vomiting; (3) diadokokinesis of the right upper extremity; (4) internal strabismus of left eye; (5) crying out aloud, and at times drowsiness; (6) slight facial paresis on the right side.

On the other hand, no nystagmus was observed and the fundi were normal; Wassermann negative. There was no spontaneous past-pointing, and the labyrinthine tests (turning and caloric) gave perfectly normal results as regards nystagmus, vertigo and past-pointing. The post-mortem examination revealed a small cauliflower-like mass growing from the superior vermis, projecting anteriorly and invading the superior peduncles nearly as far as the quadrigeminal bodies. There was no lesion of the right cerebellar hemisphere. Microscopically the growth was a large spindle-celled sarcoma. No operation was performed.

ANDREW CAMPBELL.

## PHARYNX.

*Unhealthy Tonsils associated with Cervical Adenitis.* W. G. HOWARTH and S. R. GLOYNE. (*Lancet*, 1923, i., 1202.)

The authors detail their further research since the publication of their first paper in the *Lancet* nearly two years ago. Their results are as follows: In enlarged and unhealthy tonsils associated with

# Pharynx

cervical adenitis in children, the chief histological changes are marked increase in the lymphoid tissue and lesions in the crypts. Every tonsil showed bacterial infection and 56 per cent. of the bacteria were virulent for the mouse. Bacteria tend to follow a definite path, reaching the lymph tracks of the pharyngeal wall. In a separate series examined for tuberculosis it was found that the giant cells were generally in the lymphoid tissue, but rarely seen elsewhere. The authors' conclusions are that rather more than half of the children with enlarged and unhealthy tonsils associated with cervical adenitis harboured pathogenic organisms in their tonsils, the streptococcus being the commonest. On the other hand, tuberculosis was only found in about 5 per cent. of cases. It seems probable, therefore, that tuberculosis is only a late infection; a view borne out by the fact that, when the infected tonsils are removed by operation, the affected glands frequently subside. The children examined were between two and fifteen years of age.

MACLEOD YEARSLEY.

## *Lessons to be learned from the Results of Tonsillectomy in Adult Life.*

W. C. ALVAREZ. (*Journ. Amer. Med. Assoc.*, 26th May 1923.)

With a view to ascertaining the end-results and determining the indications for tonsillectomy, the writer questioned 345 patients whose tonsils had been removed. "One person in every four, entering my office," he states, "has had his or her tonsils out."

The best results are obtained in those who suffer from definite tonsillitis. In such cases a cure may be predicted in most cases. Less satisfactory are those whose tonsils have been removed simply because pus could be expressed from them. In only 10 of the 32 cases in this group was improvement noted.

The results of removal for "rheumatism" were poor, only 7 of the 47 cases reporting a cure, and 5 reporting improvement.

Tonsillectomy should not be done for the relief of troubles outside the throat until the patient has been carefully studied by a competent physician.

DOUGLAS GUTHRIE.

## *The After-Results of the Different Methods of Tonsillectomy, with Special Reference to the La Force Guillotine as compared with the Ordinary Dissection with Snare: A Critical Review of 200 Cases.*

R. PATTERSON. (*Laryngoscope*, Vol. xxxiii., No. 4, p. 280.)

Dr Patterson, while doing post-graduate work in Philadelphia, investigated the different methods of tonsillectomy taught by the various schools in that city. Among causes of poor results are (1) a tendency to hurry on the part of the surgeon; (2) lack of proper training by many who claim to be specialists; (3) general practitioners

## Abstracts

and surgeons who consider the operation to be a minor procedure that any tyro may undertake.

The following are the headings under which the results were judged: (1) Hæmorrhage; (2) complete removal of the tonsil; (3) injury to pillars, uvula, palate, and pharyngeal muscles; (4) preservation of normal anatomic relations; (5) time of operation; (6) need of assistance; (7) ease of operation; (8) interference with anæsthetists; (9) degree of reaction.

The La Force Guillotine and the snare methods are compared under the headings mentioned. In every instance the La Force method gave the more favourable results. Post-operative results in 150 cases show the following:—

Parts Injured.	Snare, 75 cases.	La Force, 75 cases.
Soft palate injured . . . . .	2	0
Part of tonsil remaining . . . . .	12	8
Anterior pillar injured . . . . .	19	15
Posterior pillar injured . . . . .	23	0
Anterior and posterior pillar injured . . . . .	13	0
Either anterior or posterior pillar injured . . . . .	52	19

The absence of hæmorrhage is emphasised in the La Force method; the author states that the operation may be completed without soiling a pair of white gloves. Obviously this is a great advantage in anæmic and weak patients. Apparently all the operations were carried out on children under general anæsthesia.

ANDREW CAMPBELL.

### PHARYNX AND NASOPHARYNX.

*Round-celled Sarcoma of the Pharynx with Glandular Involvement, with a Comparison of the Results of Treatment by Excision and X-Rays.* Professor JACQUES. (*L'Oto-Rhino-Laryngologie Internationale*, January 1923.)

A primary growth in the tonsillar region disappeared with the application of radium. No recurrence took place at this site, but two rapidly growing secondary masses appeared at the root of the neck, one on the right sub-clavicular region and the other below the lower half of the left sterno-mastoid, infiltrating the muscle and large vessels. The tumour on the right side was excised without difficulty, and was identical in structure with the primary growth. That on the left was too extensive for removal and was treated with radium needles, with a dose of 10 mgms. for forty-eight hours. In less than a week the growth had entirely disappeared. A recurrence rapidly took place on the side operated on, the radiated side, however, remaining free.

A. J. WRIGHT.

# Pharynx and Nasopharynx

*Transnasal Dilatation in Adhesions of the Soft Palate to the Posterior Pharyngeal Wall.* A. RÉTHI, Budapest. (*Zeitschrift f. Hals-, Nasen-, und Ohrenheilkunde*, Vol. ii., p. 260, 1922.)

After detachment and the formation of plastic flaps Réthi uses a long-curved dilator which he passes through the nose; the blades are crossed and introduced one into each nostril, then fixed by a screw at a joint after the fashion of midwifery forceps. The outer ends are compressed together by means of a screw with a winding nut. One case derived great benefit from the use of this instrument after simple detachment without plastic flaps. The instrument is first introduced daily, and, later, every two, three or four days, and worn during either the day or the night.

JAMES DUNDAS-GRANT.

*The Significance and Treatment of Adhesions in the Oro-Pharynx.* KARL SCHROEDER, Hamburg. (*Zeitschrift f. Hals-, Nasen-, und Ohrenheilkunde*, Vol. ii., p. 379, 1922.)

After the operative detachment of the adhesions the writer enumerates various methods of preventing reunion of the cut surfaces or contraction of the cicatrices, and he quotes Réthi's five groups, traction, expansion, obturator, plastic, instrumental dilatation. Schroeder's method after detaching the adhesions is to make a small apron out of a piece of india-rubber bandage doubled on itself, of such a size as to go conveniently behind the soft palate; to each of the strings of the apron he attaches a silk ligature which he passes through the respective nostrils from behind forward, *secundum artem*. To keep up the dilatation he uses above all the finger, and further a two-bladed dilating instrument passed through the mouth after the fashion of a Hajek's dilator, and this is kept in for half an hour at a time or longer. He also recommends self-massage, by means of a Hartmann's wool-holder on which a lubricated pledget of wool is wrapped. As regards the duration of treatment he allows two or three years. The result depends on patience and energy and, naturally, also on the extent of the cicatrices and the duration of the adhesions.

JAMES DUNDAS-GRANT.

## THE ŒSOPHAGUS.

*Metastases of Œsophageal Carcinoma.* GORDON F. HELSLEY, M.D. (*Annals of Surgery*, March 1923.)

Evidence is brought to show that metastases in œsophageal cancer do not occur very early. In a series of 70 fatal cases, 64 per cent. had no metastases and 6 per cent. had secondary growths limited to regional lymph nodes.

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Considering the average duration of symptoms (4 to 8 months), it is thought that there is ample time for diagnosis and treatment before metastases appear.

The possibility of metastases in carcinoma of the œsophagus, without definite evidence of the same, should not be advanced as contra-indicating radical operation.

W. NICOL RANKIN.

*Treatment of Diverticulum of the Œsophagus.* CHARLES H. MAYO, M.D.  
(*Annals of Surgery*, March 1923.)

Three methods of treatment are mentioned: (1) External surgical removal in one or two stages; (2) change of position; (3) obliteration.

If general anaesthesia is employed, the sac must be well emptied. Danger of suffocation is thought to be so great that local anaesthesia, usually novocaine, is used in practically all cases.

With small sacs, choice of operation is open; with large sacs, extending to the thorax, the two-stage operation is recommended with the sac unopened at the first stage.

The sac is delivered unopened through an incision in the line of the natural crease of the neck, packed around with a layer of gauze, or placed within a soft rubber drain to prevent union to the incision and skin, and it should be amputated and closed by suture ten or twelve days later.

In the period between the first and second operations the mediastinal space becomes closed and protected by granulation tissue.

It is believed that this method of treatment accounts for the low mortality of the operated cases in the Mayo clinic—3 deaths in 74 cases.

W. NICOL RANKIN.

*Surgical Treatment of the Œsophagus.* HERMANN FISCHER, M.D.  
(New York). (*Archives of Surgery*, January 1923, Part 2.)

The article is an extensive and carefully considered review of the present position of surgical treatment of malignant disease of the œsophagus. The initial work of Sauerbach with his negative pressure chamber rendered surgical treatment possible; this method was gradually replaced by positive intratracheal pressure. Torek, in 1913, effected the first successful transpleural œsophagectomy. Enderlen approached the gullet by resection of the posterior costal arches and reflection of the pleura. He considered it possible to resect the œsophagus from its bed without injury to its walls, but found it impossible to resect the tube and restore the lumen by circular suture.

Von Mickulicz was the first to approach the œsophagus by the anterior route in dogs, and found an end-to-end suture possible in



# Œsophagus

these animals. The chief difficulties to be encountered were: (a) pneumothorax, and (b) reconstruction of the œsophagus: he found that in the absence of a serous coat, the muscular coat is thin and easily torn; it stretches freely but the sutures cut out.

Biondi, in 1896, performed a partial resection of the œsophagus in the dog, and drew a portion of the stomach up to meet the divided end and sutured it in position. Levy, in 1898, worked out an experimental method of inverting the œsophagus in dogs by pulling the upper end downwards by a thread through a gastrostomy opening. Ash, in 1912, removed the entire gullet. The patient made an uneventful operative recovery but died of inanition. During the course of the operation both vagi were cut. When the first was severed the pulse dropped to 44, but when the second was divided the pulse returned to normal.

*Transpleural Methods.*—Since the advent of differential pressure, the gullet has been attacked by the transpleural route, but the following disadvantages arise: 1. The pleura is very sensitive to infections; 2. the lungs are very sensitive and powerful reflexes result from manipulation; 3. the question of drainage is difficult. For these reasons many surgeons have gone back to extrapleural drainage.

Kümmel, with one hand in the abdomen and one in the neck, in the case of a man with a short thorax, succeeded in removing the œsophagus and anastomosing the stomach to the cervical œsophagus in the neck. The author, however, questions whether the presence of the stomach in the thorax does not interfere with the action of the heart and lungs.

The author traces the following stages in development:—

- (a) Extrapleural dorsal route with attempts to reconstruct the lumen.
- (b) Transpleural differential restoration of tube by stomach or buttons.
- (c) Transpleural with removal of the whole œsophagus and the fixation of the stump outside.
- (d) Extrapleural removal of entire œsophagus by evagination, using the combined abdominal and neck routes with or without transposition of stomach.

*Results.*—Only cases involving the cardiac portion recovered. The author places on record three cases which recovered, but of these, one died of recurrence a few months later.

The article is completed by an extensive bibliography.

E. MUSGRAVE WOODMAN.

## REVIEWS OF BOOKS

*Tonsillectomy.* GREENFIELD SLUDER, M.D., F.A.C.S. Henry Kimpton: London, 1923.

In this valuable monograph, Professor Sluder gives a full account of the method of tonsillectomy "by means of the alveolar eminence of the mandible and a guillotine," and he deals at length with the indications and results.

The description of the method is admirably clear, and is simplified by a study of the variations of the alveolar eminence—a region of the mandible that receives scant attention in anatomical text-books. It is largely owing to this lack of recognition of the bony point that so many of us must plead guilty "just to picking up the tonsil with a guillotine and removing it," as Professor Sluder says. The bony prominence is, however, shown in J. E. Frazer's *Anatomy of the Human Skeleton* (1920) as the "alveolar prominence." Sluder points out the difficulty of retaining the last piece of the tonsil in the ring by any method in which a powerful instrument requiring two hands is used; in this connection the ratchet guillotine of Elphick is worthy of mention. Especial stress is laid on the importance of the "fourth movement," which consists in pointing the shaft to the shoulder-tip of the side operated upon.

It is a pity that the author had not dealt more fully with post-operative difficulties. Severe, or even disconcerting hæmorrhage is not common, but, when it does occur, it more than makes up for its rarity by the anxiety it causes. Undoubtedly it is right that "spouting vessels should be caught and tied," but that this may be rather a difficult piece of surgical gymnastics is amply proved by the multiplicity of instruments devised for accomplishing it. A complication not dealt with here is the so-called "tight palate" that is sometimes associated with scarring in the tonsillar fossa. It is not a popular subject for discussion, but it may occur after the most careful operation, and, on this point, Professor Sluder's opinion would be most useful. It would be of interest to know whether he has found it follow the method of passing stitches under the whole wound to arrest hæmorrhage—a proceeding that is, perhaps unjustly, often credited with causing the condition.

The case for guillotine as against blunt dissection and snare is stated very fairly; probably most of us who have not Professor Sluder's skill and experience will prefer the guillotine as the method of choice, but will keep blunt dissection for the most difficult cases.

Perhaps the most important part of the book is the section on pathology and the indications for operation. In the first, Dr Proetz

## Reviews of Books

deals fully with the various views on tonsillar function. He also expounds clearly the difference between lacunar and follicular tonsillitis, and points out the importance of the small fibrous tonsil. There is a good account of the tuberculous tonsil.

In the chapter on the indications for operation, the author deals very equitably and comprehensively with a difficult subject, and gives close consideration to views with which he, and the mass of his confrères, thoroughly disagree—*e.g.* Kaiser's opinion on the poor results obtained by tonsillectomy in cervical adenitis. Unfortunately, hardly any mention is made of the indications for tonsillectomy in eustachian and middle ear troubles; it is to be hoped that this omission will be rectified in later editions. The question of tonsillectomy in goitre is dealt with lucidly and suggestively. The author mentions a belief among the laity that the tonsil and the testicle are associated; it is interesting to find that a survival of homœopathic magic, still prevalent in parts of rural England, is not unknown in St Louis.

There is a good chapter on embryology and anatomy, in which due recognition is given to the work of Fetterolf, and to the researches of Hett and Butterfield.

It is hardly necessary to say of a book of Professor Sluder's that it is admirably got up, well illustrated, well documented, and well indexed.

F. W. WATKYN-THOMAS.

*The Tonsils: Faucial, Lingual and Pharyngeal.* By HARRY A. BARNES, M.D. 2nd Edition. London: Henry Kimpton, 1923.

The second edition of *The Tonsils*, by Harry A. Barnes, M.D., Laryngologist to the Harvard Medical School, is an excellent book. Larger than the first edition, it maintains the same high standard and reflects the present-day clinical importance of these organs.

The mode of development of each tonsil from two buds in the second pharyngeal pouch is clearly told, while the description of the part played by the intratonsillar fold and by the plica triangularis, in determining the form of the mature organ, explains the clinical appearances which the tonsil presents.

The anatomical relations are well set forth, and the fact that a sponge, pressed into the empty and bleeding tonsillar fossa, can be gripped by the surgeon externally, behind and below the angle of the lower jaw, is of very practical use in controlling hæmorrhage.

The author supports the hæmopoietic theory of the function of the tonsils, as this alone rests on definite histological findings. For this reason the tonsils should be respected as functioning organs and not removed without adequate reason, especially in children. The

## Reviews of Books

particular reasons for removal are given at length in the chapter on surgery.

The development of the normal and the abnormal crypt is dealt with. The pathological significance of the long tortuous crypt filled with degenerated epithelium, as a breeding-ground for bacteria and as an absorption area for the bacterial products, is laid stress on. The fact that the blind ends of these crypts are always in close relationship to the fibrous capsule is of paramount importance, and any operation which does not split the tonsillar capsule and so remove the blind end is most unsatisfactory. For this reason, Dr Barnes dismisses tonsillotomy as an obsolete procedure.

The diseases of the tonsil are ably reviewed. The portion dealing with peritonsillar abscess is particularly instructive—the method of treatment by enucleation of the tonsil has the author's whole-hearted support.

In performing tonsillectomy Dr Barnes prefers general ether anaesthesia, with the patient in the sitting posture, as observation of the parts is best obtained in this position. He always uses the combined method of dissection and snare. The knife is a straight one. Sluder's operation, or one of its modifications, he regards as an eminently satisfactory capsule-splitting operation, but he points out that there are fibrous adherent tonsils that must be dissected out, and good technique cannot be obtained unless one is continually dissecting. The different operations are described at length.

Complications following operation receive full consideration. The correct method of suturing the pillars of the fauces in order to include the bleeding tonsillar bed in the suture is diagrammatically shown.

The book ends with a summing up of the value of radiation in the treatment of hypertrophied tonsils. It undoubtedly reduces the size and opens up the crypts temporarily, but, in his experience, the improvement is not permanent, and Dr Barnes is of opinion that X-rays will not replace surgery as a means of treatment.

The charm of this well-illustrated book is that it is a record of the author's personal work and experience.

DONALD WATSON.

*Asthma.* FRANK COKE, F.R.C.S. Bristol: John Wright & Sons, Ltd. 1923.

To Mr Frank Coke and his friend, the late Dr Latham, we, in this country at least, owe some of our knowledge of the relationship of asthma to anaphylaxis and of the value of dermal tests. Besredka himself says: "Anaphylaxis has become quite the fashion," so, whereas twenty-five years ago the cry was "hunt for the germ," now it is "hunt for the protein."

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Mr Coke's book, excellent in many ways, is a picture of this method. The bulk of it is a sermon on the text, "In asthma, remember anaphylaxis," and the truth is hammered home with one striking case after another, till "it is borne in on us" that we have been "sitting in darkness." But even on his own showing the connection of asthma with anaphylaxis exists in only about half the cases; we would urge that, when he finds the explanation of the other half, he will discover why the allergic half exists. Take one example, Widal's case of the sheep-dealer, thrice quoted by Mr Coke and mentioned also by Professor André Levi, as having "all the precision of a laboratory experiment." This man, from the age of 12, had been in daily contact with sheep until he was 47, when he had a typical attack of asthma. He then had frequent attacks when he was in contact with them, at first, only in summer, and, afterwards, all through the year. Each attack after exposure was preceded by a condition of shock (fall in blood pressure, leucopenia, etc.). "The anaphylactic origin of asthma has thus been proved experimentally and clinically" (Levi). But what about "the precision of a laboratory experiment?" The man had had 11,000 daily exposures to sheep before he developed "anaphylaxis." Nothing is said about the other conditions that must have been in play during thirty-five years, conditions obviously essential to the development of the "anaphylaxis"—diet, exercise, digestion, condition of teeth, nose, etc.

At the Newcastle Meeting of the British Medical Association, Dr Warren Crowe mentioned one case (quoted by Mr Coke) which throws much light on the sensitisation of asthmatics—a farmer who had asthma on going near horses, but was free, although in charge of them while in the army, and again subject to it after demobilisation. A similar story could be told of dozens of asthmatics who entered the army during the war, and in relation to the metabolic disturbance that leads up to asthma, it is as important as any experiments that have been made on anaphylaxis. Such cases show that the "sensitiveness of asthmatics is, at least, in many cases, preceded by metabolic disorder, sometimes chronic and produced by hygienic errors, sometimes a more acute colloidal disturbance started by an infection like pneumonia or whooping-cough, a disorder that is essential to the development of the anaphylactoid state. This may be overcome by methods—not neglected by Mr Coke—more wholesome to the general well-being of the patient than concentration on the foreign protein. But when, in the complexities of modern civilisation, a patient cannot or will not adopt such methods, those indicated by the author will prove valuable.

Mr Coke brings forward enough cases to show that sensitiveness is commoner than medical men were inclined to believe, and in this they

## Reviews of Books

are his debtors; he adduces, as proof, skin tests and the convincing results of his treatment. Probably the skin tests are most valuable in dealing with cases hypersensitive to hairs, furs, feathers, pollens, and oats; but disappointment with dermal reactions and hesitancy about accepting anaphylaxis as the clue through the mazes of asthma, hay fever, eczema, epilepsy, etc., are fairly widespread in the profession.

It is to be regretted in regard to the production of these diseases that Mr Coke does not take more into consideration the effect of carbohydrate excess, and the consequent result of this on protein metabolism, perhaps the most important point in dealing with asthma. Too little stress is laid on the general metabolism. The chapter on the relation of the nose to asthma is excellent.

One case of special interest to the rhinologist may be quoted. A lady, aged 50, had asthma for a lifetime, tests positive for hen and goose feathers, nose full of polypi, frequently operated upon. Feathers were avoided and autogenous mixed coliform vaccine was employed. After six weeks asthma had disappeared, as well as the polypi in the right nostril; in the left they were shrunken.

The remarks on diet and exercise are just; the whole outline of treatment good. Among the remedies for hay-fever Mr Coke does not mention chloral. This is known to prevent anaphylaxis, and it sometimes abolishes hay-fever in children. If he will use a bronchoscope, he will find his surmise as to the action of the bronchial muscles in ordinary respiration confirmed. He says that asthma is a symptom, not a disease; yet Chapter V. is devoted to "The Symptoms and Physical Signs of a Paroxysm." This seems contradictory, but he is right both times; it is a matter of using words in different applications. The paroxysm—the bronchiolar constriction is the symptom of the disease, and so is used to name the disease, just as we do not intend the term locomotor ataxy to exclude lightning pains. Our nosology for another generation, at any rate, will go on calling eczema, asthma, and hay-fever diseases rather than symptoms.

Though there is much that is speculative in the book, it is ingenious and suggestive speculation, and there is no one who in his handling of asthma, hay-fever, and kindred diseases will not profit from Mr Coke's teaching. Those who see many asthmatics cannot fail to be surprised that while so much new and good biochemical work is being done in relation to glycosuria and renal disorders, asthma is so much neglected; for, as Mr Coke says, "there is no other complaint, unless it be cancer, that brings us so rapidly and so closely into touch with the very secrets of life itself."

JAMES ADAM.

# GENERAL NOTES

ROYAL SOCIETY OF MEDICINE,

1 Wimpole Street, London, W. 1.

*Section of Laryngology*—President, H. J. Banks-Davis, F.R.C.P.—*Hon. Secretaries*, Mr J. F. O'Malley, F.R.C.S., and Mr E. D. D. Davis, F.R.C.S.

The next Meeting of the Section will be held on Friday, 7th December, at 4.45 P.M. Members who are desirous of showing patients or specimens should give notice of the same to the *Senior Hon. Secretary*, Mr J. F. O'Malley, 6 Upper Wimpole Street, London, W. 1, at least twelve days before the Meeting.

*Section of Otology*—President, Mr Sydney Scott, M.S. *Hon. Secretaries*, Mr Archer Ryland, F.R.C.S.(Ed.), and Mr T. H. Just, F.R.C.S.

The next Meeting of the Section will be held on Saturday, 8th December, at 10 A.M. Members who are desirous of showing patients or specimens should give notice of the same to the *Senior Hon. Secretary*, Mr Archer Ryland, 50 Harley Street, London, W. 1, at least twelve days before the date of the Meeting.

On Friday, 7th December, at 8.30 P.M., the Sections of Anæsthetics, Laryngology, Otology, Odontology, Ophthalmology, and Surgery will discuss "The Comparative Value of Cocaine Substitutes."

During the Session 1923-24, the Meetings of the Sections of Laryngology and Otology will be held on the following dates :—

*Section of Laryngology*, 7th December 1923, 1st February 1924, 7th March, 4th April, and 2nd May.

*Section of Otology* will meet on the day following each of the above dates.

A Conjoint Summer Meeting of the Sections of Laryngology and Otology will be held in London on Friday and Saturday, 27th and 28th June 1924.

\* \* \*

## LIGHT TREATMENT OF LARYNGEAL TUBERCULOSIS.

We are glad to hear that Dr O. O. Strandberg, who is in charge of the Throat and Ear Department of the Finsen Institute in Copenhagen, has been invited to give an Address before the Royal Society of Medicine, London. This will take place at No. 1 Wimpole Street, on Monday 3rd December, at 5.30 P.M. The subject will be, "The Treatment of Tubercle of the Larynx and Nose by the Arc Light."

\* \* \*

Dr J. S. Fraser, Edinburgh, has been elected an Honorary Member of the American Laryngological, Rhinological, and Otological Society.

\* \* \*

The University of Vienna has arranged for a series of Post-Graduate Courses to be held during the months of October, November, and December. A special intensive course in Laryngology and Otology will

## General Notes

be held from 3rd to 15th December. The course will include instruction by Professors Hajek, Alexander, Neumann, Ruttin, Hugo Frey, and Marschik.

\* \* \*

At the opening of the Autumn Session at the Central London Throat and Ear Hospital, on 4th October, Mr W. Stuart-Low, F.R.C.S., one of the Consulting Surgeons to the hospital, delivered an address on "The Functions of the Mucous Membranes in Diseases of the Throat, Nose, and Ear," dealing especially with the rôle of mucin. The Chair was taken by Dr Andrew Wylie, and a vote of thanks was proposed by Mr W. H. Kelson. The Meeting was attended by some thirty guests of the staff.

\* \* \*

### TEAM WORK IN NATURE.

Mr Somerville Hastings, F.R.C.S., Surgeon in Charge of the Ear and Throat Department, in opening the Winter Session at the Middlesex Hospital on the 2nd October, dealt with Team Work in Nature. Amongst the examples which he selected to illustrate this fascinating subject, was the close co-operation which existed between the lowly Fungi and certain of the flowering plants. Nature's method of providing the nitrogen, so necessary for plant life, was beautifully illustrated in his description of the life-history of the fungus dwelling in the root nodules of the Lupin and the Orchid and in the seed coats of the Heather. The bacteria, in exchange for the life-giving element supplied to the plant, are provided with a comfortable home, the means of subsistence and the opportunity of begetting the next generation. There is thus a community of interest, a friendly co-operation between fungus and flowering plant, and a security of the best conditions for survival.

To the students, whom he addressed, entering the hospital for the first time to engage in their medical studies, the lecturer made plain, not only certain facts of great biological interest, but, at the same time, cannot have failed to have imparted the useful lesson that both in the hospital and in the profession which lay before them, there was ample scope for the employment of human team work.

\* \* \*

The following books have been received for review :—

*Aromatics and the Soul: a Study of Smells.* By Dan McKenzie, M.D. London: William Heinemann (Medical Books), Ltd., 1923. Price 7s. 6d. net.

*Anleitung zu den Operationen am Gehörorgan an den Tonsillen und in der Nase.* By Adolf Passow und Hans Claus, 2nd edition. Leipzig: Verlag von Ambrosius Barth, 1923.

*Hodgkin's Disease.* By R. Allan Bennett, M.D. Lond. Bristol: John Wright & Sons, Ltd., 1923. Price 2s. net.



# The Journal of Laryngology and Otology

(Founded in 1887 by MORELL MACKENZIE and NORRIS WOLFENDEN)

EDITED BY

A. LOGAN TURNER AND J. S. FRASER

ASSISTED BY

DOUGLAS GUTHRIE AND IRWIN MOORE

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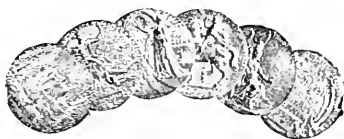
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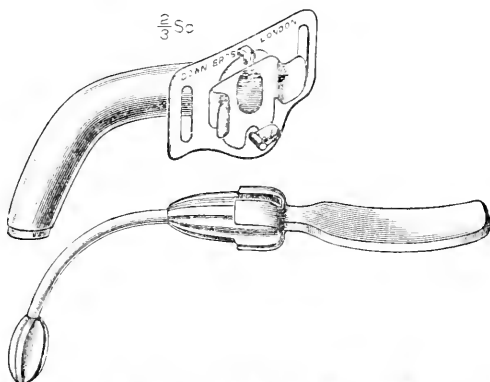
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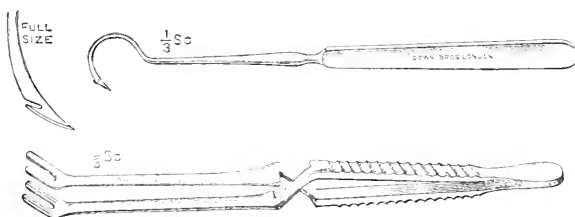


Gold Medal, Allahabad, 1910.

**A NEW TRACHEOTOMY TUBE**

(Pilot permits breathing during introduction)

By Dr A. CUBLEY

*Vide Journal of Laryngology and Otology, March 1922.***Needle for Suturing the Pillars of the Fauces,  
and Forceps for Carrying the Suture.**

By Mr THOS. GUTHRIE, F.R.C.S.

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# The Journal of Laryngology and Otology

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## THE ADVANCEMENT OF LARYNGOLOGY AND OTOLOGY: A PLEA FOR ADEQUATE TRAIN- ING AND CLOSER CO-OPERATIVE ACTION.\*

By A. LOGAN TURNER, M.D.Ed., F.R.C.S. Ed.

### Introduction.

MY first and most pleasing duty is to thank the members of the Semon Lecture Board for the great honour which they have conferred upon me in selecting me as the Semon Lecturer in Laryngology for the present year. The honour is one which I fully appreciate. At the same time, I realise that it places on my shoulders a responsibility which I, in no sense, underestimate. I am conscious of the fact that there are many laryngologists, both in this country and abroad, who would uphold, more worthily than I, the position to which I have been called. They would have put before you, in a more satisfactory manner than I can do, some aspect of the science or practice of laryngology, the subject which had so eminent a representative in the distinguished founder of this lectureship.

It is unnecessary for me to recall, on this occasion, the events which led up to its foundation, but it is fitting that I should take this opportunity of expressing my sense of indebtedness to the late Sir Felix Semon for instituting a lectureship of this kind, and thus placing the specialty on an equal platform with other departments of medicine and surgery which are similarly endowed.

My selection by the Board, notwithstanding the responsibility which it entails, is particularly gratifying to me for two

\* Being the "Semon Lecture" (University of London), delivered in the Hall of the Royal Society of Medicine, 1st November 1923.

## A. Logan Turner

reasons. The choice has, once more, fallen upon a laryngologist dwelling north of the Tweed. It has, therefore, conferred a distinction upon the exponents of the specialty practising in Scotland, an honour duly appreciated by us. My personal gratification is enhanced, too, by the fact that I have been asked to occupy the position held, in 1913, by my former teacher and revered chief, Dr Peter M'Bride, the first Semon lecturer.

The choice of a suitable theme upon which to address you presented difficulties. Fortunately, the Trust Deed offers considerable latitude to the lecturer in the preparation of his subject, nor does it limit him to the exposition of the purely scientific side of his professional calling. After much deliberation, it seemed to me that it would be appropriate to touch upon an aspect of the specialty which has not, hitherto, formed the thesis of any of the four holders of this office. As a teacher of laryngology and otology for twenty-five years, in a School which has always held a leading position in medical education, and as one who has endeavoured, with the assistance of his colleagues, to organise the work of a Department, I may be permitted to draw your attention to the consideration of the teaching of the specialty and to the better organisation of our clinics. The present time appears to be most suitable for the deliberation of these points. The period through which we are passing has brought certain educational changes which will undoubtedly affect the work of those of us whose duties lie in the great teaching hospitals. The new regulations governing the medical curriculum, recently drawn up by the General Medical Council, which came into force in January of this year, have made the teaching of laryngology and otology compulsory for every candidate seeking a degree or a qualification in medicine and surgery. Again, the Conjoint Board of the two Royal Colleges in London have favourably considered the proposals of the Councils of the Sections of Laryngology and Otology of the Royal Society of Medicine, and have decided to grant, after examination, a special Diploma in oto-laryngology. Its object is to provide a preliminary theoretical and practical training, and a "hall-mark," for those medical officers working under the Ministry of Health and the Educational Authority, whose duties will be mainly concerned with the diagnosis and treatment of throat and ear disease. The Diploma marks a forward step in the history of laryngology and otology. The public will benefit from the training which the medical officers

# Advancement of Laryngology and Otology

receive, and the specialty will gain prestige through the better conduct of the work which they perform. The education of the young specialist, too, is a matter for our consideration.

All of us, therefore, who are really interested in the welfare and progress of these branches of medicine and surgery should carefully consider the best means to be adopted to provide both student and specialist with adequate training. At the same time it would, I think, be unfortunate, if we confined our deliberations merely to these two aspects of our future educational policy. If the advancement of laryngology is to be studied from the broadest standpoint, the subject must not only be treated from the limited point of view of the instruction of the student of medicine and the training of the young specialist; it must include, also, the education of the teacher himself. This implies an improved organisation in our methods of work and the introduction of increased facilities for conducting research. In other words, our own education is intimately linked with that of the student and the graduate. It is to the contemplation of certain suggestions under these three heads that I propose now to ask your attention. With the inclusion of otology in the medical curriculum, my remarks must, of necessity, embrace also that subject.

Let us glance for a few moments at the position which laryngology occupied in this country in Semon's early days in London, when, as a young and unknown man, he commenced his professional career in the later seventies. A brief retrospect is necessary in order to illuminate the steady march of progress.

In the first Semon lecture Dr M'Bride sketched the status of the specialty as it was, less than fifty years ago. Unfortunately, for reasons which we need not specify, it was then under a cloud. It is true laryngology was a comparatively young offshoot from the parent stem, and the immediate prospect of its attaining more mature growth was still somewhat uncertain. The hospitals and the teaching schools regarded the specialty with indifference. It had no *locus standi* in the general hospitals, and the patients who sought advice for throat complaints received treatment at the hands of the junior physicians on the staff. Hughlings Jackson was then in charge of the Throat Department at the London Hospital, Lauder Brunton at St Bartholomew's, and W. S. Greenfield at St Thomas's. Aural departments, placed in the hands of

## A. Logan Turner

specialists, antedated those designed for throat affections. In 1851, Joseph Toynbee had been appointed to St Mary's, the first of the great hospitals in London to initiate the movement. Sir William Dalby started work at St George's in 1872, Laidlaw Purvis at Guy's in 1874, and, in 1876, Dr Urban Pritchard, our *doyen*, was appointed to King's College Hospital.

In the medical curriculum, however, the study of otolaryngology was unknown, and students received no encouragement to avail themselves of such instruction as could be obtained at the few special or private hospitals which then existed in London and in various provincial centres. Nevertheless, laryngology, even at that time, had attained in the hands of its pioneers both a scientific status and a position of clinical usefulness, which certainly merited a more generous recognition from the hospitals and schools. With the introduction of the laryngoscope, a valuable addition had been made to the diagnostic equipment of the future practitioner of medicine; yet those interested in the training of the student were not apparently alive to the fact that it and the otoscope, although of less clinical value than the ophthalmoscope and the microscope, might reasonably have been included in the student's hospital training. Possibly, at the present day, we tend to be hypercritical of the conservative attitude of the hospital and teaching authorities of forty years ago, forgetting that the specialty, then, had limitations which no longer exist; operative work was on a small scale, our boundaries had not as yet extended, on the one hand, into the nasal sinuses and the cranial cavity, nor, on the other, into the lower air passages and œsophagus: and there were no Societies, associated with the special study of laryngology and otology, to wield their undoubted influence for good.

At the same time, in some of the medical schools and universities on the Continent and in the United States, instruction and training had become a routine measure as early as the sixties. In Vienna, Türck had, in 1864, been appointed Professor of Laryngology, and in New York, Lewis Elsberg received similar status four years later. As early as 1875, the teaching of laryngology had been included in the curriculum of the Harvard Medical School and in the College of Physicians and Surgeons of New York.

Those who are cognisant of the energy and ability which Semon displayed during the first five years of his professional

# Advancement of Laryngology and Otology

life in London will agree that, through his zeal and efforts, the specialty came to receive, at the hands of the hospital authorities, the recognition which was justly due to it. In 1882, he was appointed Assistant Physician in charge of the Throat Department at St Thomas's, *vice* W. S. Greenfield; it is interesting to note from a study of the reports of the hospital, that, from the very outset, he undertook the annual publication of statistical records of the material passing through his hands. From that time onwards, the special departments in the general hospitals, both in London and in the provincial towns, have increased steadily in number, many of them becoming staffed by men who had received their early training in the special hospitals which, often under difficulties, carried on their useful and valuable work.

## The Education of the Student of Medicine.

The development of instruction in laryngology and otology in the medical schools of this country has been gradual during the last twenty-five years, receiving due recognition by some of the Licensing Bodies, but being continually neglected by others; first, introduced into the curriculum as an optional course; later, raised to the position of a compulsory subject; and finally, given professional status by reason of an added examination test. These are the milestones which marked the slow but steady recognition of the specialty in a few of the teaching schools. We are grateful to those authorities who acted on their own initiative; we may now congratulate ourselves upon the achievement of what we have long felt to be a real necessity in the training of the future practitioner, and we are justly pleased that the General Medical Council has at last taken the long-neglected princess by the hand and placed her upon the same platform as her haughty sisters, ophthalmology and mental diseases.

A new responsibility, therefore, has been laid upon the shoulders of the staff of many of the special departments. To some of us this opens up no fresh problem: to some, on the other hand, it is an innovation in their hospital work. To all of us it is a matter of profound interest, affecting not only ourselves as teachers, but the prestige of the special branch to which we belong. It is fitting, therefore, that those who are shortly to undertake this duty for the first time should apply their minds to a consideration of the best means of carrying it out.

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Medical education in this country has always been characterised by a broad-minded outlook which has not attempted to enforce in all the teaching schools one and the same system of instruction and examination. The individuality of the Universities and the Licensing Bodies has not been interfered with, and, so long as a satisfactory standard is maintained, it has been left to each of the qualifying bodies to adopt those methods which are best suited to the individual circumstances. By not insisting upon uniformity and stereotyped methods in the schools, but by permitting variation, the General Medical Council allows each to possess the liberty to advance and improve its own scheme of education.

A ten weeks' course of mixed didactic and clinical instruction, consisting of three meetings per week for each student, and, preferably, during the fifth year of study, is all that can be reasonably granted for one of the subsidiary subjects. If twenty hours be devoted to clinical work and ten to lectures, a considerable amount of useful knowledge can thus be imparted. The arrangement now in force in the Edinburgh curriculum, whereby the special courses in ophthalmology, dermatology, laryngology and otology occupy all the hospital hours of the student during one term, has much to recommend it. The subjects thus come to hold a more prominent position, and the concentration of the student's attention upon these particular courses during a whole Session, cannot fail to impress upon him that they are deserving of more than a mere cursory study.

The majority of teachers tend to overestimate the importance in the curriculum of the subject which they profess, and are inclined to insist upon their pupils acquiring a needless amount of detail. This danger should be carefully guarded against in our course of instruction to medical students. They should be expected, however, to acquire the modicum of knowledge necessary for the early diagnosis of the commoner affections, and sufficient to enable them to apply the measures required for their primary treatment. They should be able to recognise the symptoms which indicate the spread of local infection and the dangers arising therefrom; and to attach due significance to those symptoms and signs which, while referable to the throat and ear, may, nevertheless, be indicative of the existence of systemic disease or a central nerve affection. In order to correlate the teaching and to emphasise to the class the true significance of the laryngeal picture, in a case of



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vocal cord paralysis or a tubercular affection of the larynx, a general physical examination of the patient might be carried out, at the same time, with the assistance of one of the junior physicians on the hospital staff. In this way, too, the specialty would come to be regarded by the student as a part of clinical medicine and surgery and lose, therefore, something of its "watertight" character.

We should bear in mind also, in our course of instruction, that, in the upper air passages, there is a wide field for the beneficent application of the preventive treatment of disease, and that this aspect of the subject should be brought prominently forward. In our special branch, the means to such an end are being gradually built up, in other ways, as the century progresses. Through the agency of the Antenatal clinic, the Child Welfare organisation, and the Medical Inspection of Schools; by the appointment of aurists to fever hospitals; and now, by the compulsory education of every future practitioner in, at least, the elements of throat and ear disease, fresh links are being welded in the chain of preventive measures.

Surely, to the statistician of the distant future, the reports of the throat and ear departments, which now furnish evidence of the existence of many chronic diseases, which timeous preventive measures would have altogether abolished, will show the absence or marked diminution of the same, when he compares the records of the diseases of *his* period with those which it is our misfortune to deal with to-day!

The question of the examination test requires consideration: it is one which is also exercising the minds of our ophthalmological confrères. The time has not yet arrived when we can eliminate examinations entirely from the medical curriculum. If the objective of the teacher is to impart knowledge that will be of practical service to the future practitioner, the main objective of the student consists, too often, merely in attaining sufficient information to enable him to pass the examination tests. The fault lies, to a large extent, in the system and not in the student's attitude. In the Report of the Education Committee of the General Medical Council upon the revision of the Curriculum, it was pointed out that there was urgent need of reform, as the exigencies of the examinations threatened to dominate both teaching and study.

The recommendation of the Committee was to the effect, that the daily work of the student should be considered and

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assessed as part of the marks awarded in the professional examinations. I am well aware that such an arrangement is deemed impracticable where, as in the case of the Conjoint Board, the examining body has to deal with candidates whose education has been received in hospital schools over which the examiners have no direct educational control. In the case of the Universities, however, where the teachers are also the examiners, this objection cannot be upheld. A class record assessment combined with an examination at the end of the term of instruction would, I think, sufficiently test the student's knowledge of the subject, and, at the same time, guarantee that the status of the specialty in the curriculum was properly safeguarded. To insert into the already crowded third or final professional, a special examination on throat and ear diseases appears to be an unnecessary expedient.

### **The Education of the Young Specialist.**

The problem of the education of the young specialist is not a simple one. Doubtless, all of us have ideals and ideas as to what the course of training should be. Many of us, looking back upon our own early education, must be only too conscious of the fact that our preparation for the practice of the specialty was not what it should have been, and that it fell short of the ideal which we would like to see become a reality in the case of our successors. The advancement of knowledge has made the preparation of to-day more exacting than that of yesterday: further progress will render it yet more exacting to-morrow.

In outlining a course of training, we must endeavour to navigate safely between the Scylla of the short intensive course of cramming and the Charybdis of a too prolonged and elaborate period of study. The former method is liable to create a type of specialist whose be-all and end-all consist in perfecting himself in the art and craft of operating, with very little consideration of the science and the further development of the specialty. To this type of training we should not lend ourselves. On the other hand, to demand of the young specialist an unduly prolonged period of training would defeat the object we have in view, and tend to force many men to acquire some knowledge of the subject through the agency of short courses. The question is, undoubtedly, an economic one for some. Its financial aspect cannot be altogether ignored, and, at the present time, this side of the problem is not easy to solve.

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How can we navigate, most satisfactorily, the middle channel? Before outlining the course of special study, due consideration should be given to what ought to constitute the training in general medicine and surgery. In every case, this is a *sine quâ non* in the specialist's education. After qualifying, he would be well advised to spend at least one or two years in general practice in order to acquire a good foundation in medicine, and thus to avoid the pitfalls arising from the narrow outlook consequent upon too early specialisation. As an alternative substitute, he might hold, for a year, the post of house physician in a general hospital.

As the development of the specialty has taken place so markedly along surgical lines, it is very necessary that the standard of surgical training should be maintained at a high level. A house surgery, for a period of twelve months in a general hospital, is, therefore, a further essential preliminary. The opportunity of assisting a general surgeon in operations on the head and neck, of learning and practising the modern methods of surgical technique, and of acquiring experience in dealing with hæmorrhage and in the healing and dressing of wounds, should not be neglected. If the Fellowship of a Surgical College is to remain, in the future, as the distinctive hall-mark of the qualification of the specialist in laryngology and otology, the examination should be passed at the end of this preliminary period and before the commencement of special study. Nothing interferes so much with the young specialist's application to the intensive study of the essentials of his life's work as the preparation for a severe examination, the greater part of which has little bearing upon his future calling.

On the completion of his general training he should devote all his attention to acquiring a sound education in the science and practice of the specialty. I have ventured to sketch what would appear to be an adequate and reasonable course of study, covering a period of two and a half to three years. He should be appointed as house surgeon in a special hospital, or in the special department of a general hospital, and his period of office should cover at least one year. In selecting the hospital for this purpose he should direct his attention to the facilities which it, or the medical school in the city, could provide for the study of certain of the scientific subjects. The many hospitals in London and those in the now numerous provincial University

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towns, offer sufficient of these appointments to meet every demand of this kind likely to be made upon them.

During the first six months of his hospital appointment the house surgeon should concentrate entirely upon his clinical work, mastering the elementary details of physical and functional examination and studying the standard text-books: he will not find the time hang heavily on his hands. During the second six months, as the hospital work will not occupy the whole of his attention, he should spend certain hours in each week in the Pathological Department of the hospital or in that of the adjacent medical school. Under arrangement with the head of that department he directs his attention to the study of histology, pathology, and bacteriology. At this stage, when he is in daily contact with the patients from whom much of the material which he is to examine is derived, when he is acquainted with their clinical history, when he sees them operated upon, and has the opportunity of observing the progress of the cases, he can then derive most benefit from pathological and bacteriological work. Moreover, from the post-mortem room he can obtain the normal tissues for histological examination. I have purposely emphasised the study of histology. The microscopic anatomy of the normal is so frequently neglected, and many of us, when examining the structure of tumours or studying the spread of infection, must have deplored our ignorance of the microscopic arrangement of the normal areas with which we were dealing. Further, the pathological training must not be confined merely to the study of the pathology of the upper air passages, but it should be conducted along the broader lines of general pathology. If, in the future, the specialist is to advance the study of the science, he must acquire a wider conception of histo-pathological processes than it is possible for him to obtain by the limited observation of disease in the throat and ear. This applies, equally, to his study of infection and immunity. Due care must be taken that this part of the young specialist's work does not develop into a mere perfunctory performance. He must have his allotted place in the laboratory, under the charge of the pathologist, who directs and assists him in his work and who is prepared to furnish him with the necessary certificates, while his clinical chief keeps himself in touch with his progress.

With the commencement of the second year of training,

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the clinical experience which the year of residence in hospital has given him has taught him to recognise the subjects in which his knowledge is still defective. The first six months, therefore, should be devoted to the study of the gross and minute anatomy of the brain in its application to the specialty, to the cranial nerves and their central connections, and to the physiology and physics of the special senses, olfaction, audition, and equilibration, while some knowledge of phonetics should be obtained. For these purposes he enters the Anatomical and Physiological Departments of the Medical School and comes under the care of the teachers in these departments. The same disciplinary supervision will be required as during his pathological training.

As a combination of clinical work with the study of the scientific subjects both simplifies and enhances the value of the latter, the hospital hours during this period should be spent, partly with a physician whose work is mainly devoted to nervous diseases and, in part, in an ophthalmic clinic. These clinical courses could be taken either concurrently, in which case, two or three days per week would be given to each, or, in sequence, each course in this way being equivalent to a period of three months. Facility in the use of the ophthalmoscope, the recognition of the morbid changes in the disc, and even a slight acquaintance with the commoner affections of the eye are valuable assets to the oto-laryngologist, wherever his future field of work may be.

The second six months of the second year would be well spent abroad, in a centre or centres, where anatomical material for dissection and for a course of operations on the cadaver, and facilities for endoscopy upon dogs and on the living subject, are more easily obtained than in this country. At the same time one or more foreign languages should be studied, and opportunity taken to follow the clinical work of other specialists, in order that fresh ideas may be obtained and new methods of technique acquired.

On his return home he should spend a second period of six months' duration as a house surgeon or clinical assistant, or possibly as a tutor or demonstrator in a teaching clinic. This would enable him to assimilate and apply the knowledge gained during his previous two years of special training.

Throughout the whole course his teachers, both clinical and scientific, should make a point of stimulating in him some

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enthusiasm for research, impressing upon him its value in the preparation for the future. The interest in work, whether clinical or scientific, would be enormously increased, if his teachers would show him along what lines a useful piece of investigation may be carried out. In the event of a diploma being conferred at the end of the period of training, a thesis might be prescribed as part of the requirements necessary for obtaining it. The whole course, as thus sketched, including both general and special training, covers a period approaching five years: if diplomas should be granted, the regulations governing them should exact certificates showing evidence of scientific and clinical study over this period of time.

If such a scheme as I have outlined, or some more satisfactory scheme, is to be considered as embodying adequate training for the specialist and not unduly prolonged, are we to take it seriously, or merely regard it in the light of a pleasant academic question, suitable for discussion at some of our social gatherings? If the special hospitals devoted to laryngology and otology and the general hospitals would demand from the candidates applying for appointments on the staff of the special departments evidence that they had undergone an adequate disciplinary training, then, and not till then, can we hope to see a change in the mental outlook of the young specialist towards his training. So long as the Fellowship of one of the Royal Colleges of Surgeons—as obtained on its present basis—is made as essential a qualification for the special departments of a hospital, as it rightly is for the post of assistant surgeon to the general surgical department, so long will the prospective specialist continue to devote the greater part of his time and energy to general surgical training, instead of acquiring the necessary education in the fundamental sciences pertaining to his future life's work.

If a change is deemed advisable in this connection, the initial movement lies in our own hands. We have prevailed upon the Conjoint Board of the two Royal Colleges in London to grant a diploma for a special object; the same influence should be used, and a similar endeavour be made, to change the present attitude of the boards of management of the hospitals, and the various selection committees connected with them, towards the regulations now governing the election of candidates to the throat and ear appointments. When that is accomplished, it will rest with the Royal Colleges and the

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Universities in England, Scotland, and Ireland to frame the appropriate regulations for the training of these candidates, and to grant the diplomas necessary to meet the changed conditions of election. The Councils of the Sections of Laryngology and Otology might together consider what their policy should be in this matter, and what methods might be adopted to influence the attitude of the hospital boards towards this important question.

As an alternative scheme, is it not possible that, in the future, the Royal Colleges might consider the question of granting the Fellowship to the oto-laryngologist on a special basis: that is to say, after a prescribed course of scientific and practical training in surgery, laryngology, and otology, on the basis of that outlined, and after examination confined to the anatomy, physiology, pathology, and surgery of the territory embraced by the two specialties. By arranging the course of training so as to include experience in general surgical methods and by associating, in part of the examination, a general surgeon along with the special examiners, it would not be difficult to ensure that each candidate possessed not only the necessary knowledge regarding the special subjects, but also familiarity with the principles and practice of surgery. The marks necessary for success in the special examination might be assessed at a higher standard than that now demanded from candidates sitting for the ordinary Fellowship. Any movement for the furtherance of this alternative suggestion would also require to come from ourselves. Of the two suggested proposals, the first makes an appeal on the ground that the special diploma would indicate more definitely the character of the young specialist's training and the career which he proposed to pursue.

## **The Education of the Teacher.**

I pass now to the third part of my thesis, to the education of the teacher himself. This involves the problem of the better organisation and equipment of our departments and the provision of greater facilities both for clinical and laboratory research.

The primary function of the Universities and the teaching Corporations is to educate those entering within their gates; the primary function of the hospital clinic is to provide the necessary attention to the sick. In neither instance, however,

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ought these duties to be regarded as comprehending the sole function of the scientific staff of the school or the clinical staff of the hospital. As the instruction, both of the student and the qualified man, can only progress *pari passu* with the advancement of learning and the acquirement of fresh knowledge, so the research for new truth becomes an integral part of the function, not only of the members of the scientific departments but also of the members of the hospital staff. Moreover, the clinician, in order that he may become a successful teacher, should be an investigator, engaged in adding to the known his quota of what has been hitherto unknown. By thus educating himself through his own researches he is, at once, a more inspiring force to his pupils, creating in them, in turn, something of his own scientific enthusiasm.

If teaching on a larger scale than formerly and a more active participation in research are to be combined with the primary function of the hospital physician and surgeon, then these duties will demand from every member of the clinical staff more time and more leisure for their effective execution. If, for various reasons, an increase in the existing staff of the departments is not thought desirable, then these ends should be sought and attained by the adoption of a closer co-operative action between the individual members of the clinic.

(1) Along what lines may better organisation and co-operation be obtained within the Department itself? In recent times much has been written and something has been achieved in the establishment of the clinical unit, and to all who are interested in this aspect of the question, I would recommend the perusal of the very instructive memorandum of Sir George Newman upon "Recent Advances in Medical Education in England."

The special hospitals and the special departments in the general hospitals appear eminently suitable for the development of the team system. In some cases, these departments have their own block or pavilion. They are self-contained: they have a complete staff, graded as full surgeons, assistant surgeons, clinical tutors or demonstrators, where teaching is carried out, and clinical assistants or house surgeons. An essential and very valuable addition to such a team, if the development which I am suggesting is to be placed on a workable basis, is the provision of two or more paid secretaries attached to the



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visiting staff: their work should consist in the taking of the case notes to dictation, and in the arranging, grouping, and cataloguing of all the records of the department. By their aid the staff is relieved of much routine labour, and the work in the out-patient room is considerably accelerated.

The institution of a Library, even though small, if provided with the most recent standard works of reference, not only in the specialty but in the fundamental sciences, and with a few of the journals of current literature, would add to the equipment of the department: if reprints were invariably distributed to the different clinics throughout the country by all the writers of papers on laryngological and otological subjects, this would establish a link in the scheme of friendly co-operation.

A departmental Museum, anatomical and pathological, built up from the material gradually acquired, would be useful both for post-graduate teaching and for the research work of the staff. As regards a Laboratory, personally, I am inclined to favour the carrying on of laboratory work in the pathological department of the hospital, rather than in a special laboratory attached to the clinic. In this way, the material can be prepared and examined under the direction and supervision of a trained pathologist, an enormous advantage to the young investigator. The question, too, of the expense associated with upkeep cannot be ignored. With regard to the laboratory, however, there will probably be a difference of opinion.

The benefit derived from the microscopic examination by the same pathologist of all the pathological material obtained from one region of the body cannot be gainsaid. This is well illustrated in the reports by Professor Shattock upon the material shown by the members of the Sections of Laryngology and Otology at the meetings in this hall. If, in those hospitals provided with a sufficient pathological staff, one member was detailed to conduct the post-mortems and make all the examinations connected with the throat and ear department, the gain, both to the pathologist and to the clinical staff, would be considerable. This arrangement has been suggested by Professor Lorrain Smith, head of the Pathological Department of the Royal Infirmary, Edinburgh, and I hope that it may shortly be put into operation in that hospital.

In the larger hospitals, where the staff of the Central X-ray Department is not so limited as to prohibit some measure of decentralisation, a room in the throat department, provided

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with an apparatus which would permit of screening, would be a great advantage. With the assistance of a mechanic from the central department, the staff would be enabled to examine for themselves during the clinic the foreign body cases and the patients with symptoms of œsophageal stricture.

The selection of one of the clinical unit as a Director, responsible for the co-ordination of the various activities of the clinic—clinical, educational, and research—should be considered. In using the term Director, it must not be understood that I am suggesting the whole-time official, as in many of the already established University Units. The appointment might be filled by one of the ordinary staff of the department, or by an additional member, according to the circumstances of each individual case. With his services at their disposal for general supervision and for consultation in the more unusual cases, and provided with a proportion of the beds for observation of special conditions, he should be unencumbered with the routine duties which, to-day, occupy so much of the time and attention of the honorary staff, and which so often exhaust their energies. "The conflict of claims" between teaching and research on the one hand, and the necessities and calls of private practice on the other, tends, at the present time, to terminate, in most cases, in the victory of the latter. Under the guidance of a Director, with the subdivision of labour judiciously planned, the various members of the department would have their individual tasks lightened by co-ordination and allotment, and thus each would obtain more time to think, more leisure to assimilate, and more energy to pursue the work of investigation. As an illustration of such co-ordination, let me cite the arrangement in operation in the department with which I am associated. The whole team of six members, seniors and juniors, take part in the undergraduate teaching. No member of the staff, therefore, requires to teach on more than three days each week; consequently, each has leisure to attend to other duties. The class, too, benefits by this arrangement, as it is possible to subdivide it into a number of small sections for clinical instruction, and thus provide its members with greater opportunities for the examination of patients as well as supplying them with more individual attention. In the out-patient department and in the wards the routine work is co-ordinated on somewhat similar lines, so that the task of each member of the staff is considerably lightened. If the training of the young specialist

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is to be developed along the lines which I have already sketched, and if he is to receive more instruction at the hands of the staff, then the co-ordination of the various activities of the department will become even more necessary in the future. Only those who have attempted to deal simultaneously with the education both of the student and of the post-graduate realise the demands which the double effort makes upon their time and their energy.

Under the system which at present exists in many of our clinics, potential workers among the younger men on the staff are often not fully employed during a period when their energies are as yet unimpaired, and when they have the desire to be more actively engaged. This frequently arises from the lack of proper direction. Accurate clinical observation still offers a useful field of research for those of them who have not the faculty, nor yet the desire, for the tedium of laboratory methods. The successful results which crowned the labours of Sir Felix Semon in this direction are evidence of what may be accomplished in ordinary hospital work, if, under the guidance and supervision of a senior man, the junior would turn his attention to it.

(2) If the staff of the departments in the great teaching centres improved their equipment and co-ordinated their work on some such lines as the above so as to increase their productive powers, might it not be possible to establish co-operative action between the various throat and ear departments throughout the country? Science, we are told, knows no frontiers. Our horizon should not be confined by the limit of the four walls of our clinics, nor, if we should see beyond them, by the narrow waters of Tweed and Solway, nor even by the Seven Seas. It would be to our advantage to co-ordinate the work in the London hospitals, in the chief provincial towns, and in the University cities of Scotland; and, should our scheme develop, it might eventually embrace the work of our confrères in the Dominions overseas, working in different climes and under conditions dissimilar to our own. As a preliminary basis for this purpose, all the clinics might adopt one and the same system upon which to classify and determine the diseases of the specialty. Thus, when collective research is contemplated, each unit will be in a position to furnish the group of case histories required for the particular investigation.

An improvement upon our present "follow up" system

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would be required. The lines which have been adopted in Boston, Massachusetts, and in other American cities is worthy of consideration. In Boston, the Social Service Department is now part of the organisation of the Massachusetts General Hospital, and through the agency of its workers, the medical staff can be kept in touch with all the patients who have been discharged to their homes. By linking up the social service organisations with the throat and ear departments in the large centres in a similar way in this country, facilities would be provided to undertake satisfactorily what has always proved difficult.

The tendency, in this country, has been more in the direction of individual work than in co-operative endeavour, and while we recognise the great advances in science which have emerged from single-handed effort, and desire its continuance, we cannot deny that, by joining forces, we would still further develop clinical research and increase our output. Consider the wealth of material for statistical purposes alone which accumulates year by year in the special departments in Britain! What might not collective investigation of this material reveal? In place of the small and somewhat meagre results, which are obtained by the efforts of one or two individual clinics scattered here and there, statistics of real scientific value would be forthcoming through co-operation upon a common basis such as I have indicated. A collective investigation into the occurrence of cancer in its various forms, in the upper air passages and œsophagus, might play a valuable part, too, in that wider investigation of the origin of cancer which is now proceeding. The immediate and the end-results of our operative work on the nasal sinuses, the relative value of intranasal and external operations, and the advantage accruing from one type of operation rather than another, may be cited as illustrations of the same line of work. How much more serviceable would such a comprehensive report be than that obtained by the isolated account of cases shown at meetings of the Sections or through the occasional publication of a paper by one surgeon.

During the last four sessions of the two Sections and of the Scottish Society of Otology and Laryngology, 121 cases of malignant disease, connected with the air passages and ear, have been shown at the meetings: 47 had been treated with the knife, 33 had applications of radium and X-rays, and 20 were treated with diathermy. These figures by no means represent

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all the cases of malignant disease which have passed through our hands in that period. What was the future of these cases? What was the dosage of radium and X-rays used by the different radiologists, and what was the relative value of the various lines of treatment employed?

The difficulty in organising clinical investigation of this kind might be urged as a reason against its adoption: but I would suggest that a committee, selected by the Councils of the Sections of Laryngology and Otology, should determine, from time to time, the subject or subjects to be thus treated. The committee, consisting of men from certain of the large clinics, should be responsible for the necessary machinery and for collecting and sifting the material received. We have before us, in the Session which opens to-morrow, a closer time-association between these two Sections; they will now meet on consecutive days. Perhaps, all unconsciously, by thus providing the occasion for bringing together more frequently the members of the scattered clinics, we are paving the way for this closer co-operation. What better opportunity could we have for participation in the issue of the committee's report than in a conjoint meeting of the two Sections, such as has been arranged in June of next year? We have a Journal whose pages would welcome the publication of these investigations, where they would remain permanently as a record of reference for future comparison.

(3) If the ground has been prepared for the reorganisation of our departments, it should not be difficult to take our scheme of co-operation a step further and in yet another direction, and establish a closer alliance between our clinics and other departments of the hospital, and also between them and the laboratories in the Universities. In the former case, I would merely instance the advantage that would accrue from a closer working arrangement between ourselves and our ophthalmological colleagues. The much-vexed question of the relation between visual disturbance and nasal and sinus infection is more likely to be solved when the staffs of the two departments come together in hospital with the patients before them, than when they meet as members of two Sections to discuss the subject here.

In co-operation between the clinical department and the laboratory a more intimate association between the workers in the two departments is essential for a better understanding

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of the view point of each. It would add greatly to the value of certain lines of investigation if a regular interchange of visits could take place between both the parties concerned. It would prove specially advantageous to the laboratory worker to come in contact with the human organism, and it would help him to obtain a better appreciation of some of the difficulties which beset the clinician in the diagnosis or in the treatment of a disease. Such an understanding would apply more particularly in our line of work to the investigation connected with the employment of vaccines.

The fruits of closer co-operation with the laboratories would undoubtedly lead to the advancement of the specialty in Britain. We see it exemplified in a perfect form, in the work upon the otoliths, which is now emanating from the Utrecht School, where the clinical observations of the otologist, de Kleijn, are conducted in conjunction with Professor Magnus of the Pharmacological Institute, while the histological work on the animals which have been the subject of experiment is controlled by the neurologist, Professor Winkler of Amsterdam. I know of no similar piece of team work in the specialty in this country at the present time. There are lines of research awaiting investigation by similar collaboration to this. The recent publication by James Dawson and John W. Struthers of their valuable work upon "Generalised Osteitis Fibrosa," with a critical discussion upon the pathological processes underlying the osseous dystrophies, in which the writers draw attention, amongst other conditions, to the similarity of the histological changes found in it and in otosclerosis, demonstrates the importance of the broad pathological outlook. The comprehensive character of their work justifies the expression of the hope that, through the co-operation of such investigators in the specialty as Gray, Fraser, and Jenkins, in association with a general pathologist and a surgeon, cognisant with the whole domain of bone pathology, we might finally place to the credit of this country the discovery of the etiological factor underlying otosclerosis, and thus pave the way for the successful treatment of this distressing form of deafness. Vaso-motor instability and the functions of the inferior turbinals still require co-operation between the rhinologist and the physiologist. The relation of the various seats of focal infection in the upper air passages to chronic arthritis and allied conditions calls for further collaboration between the clinician, the bio-chemist,

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the pathologist, and the general practitioner. Veterinary science and the large field of inquiry embraced under the term of comparative anatomy and pathology offer great scope for fresh lines of co-operative effort, and some of our younger men, under the guidance of the curators, would find in our scientific museums a rich storehouse of material worthy of their attention and study.

Finally, may we not visualise an Institute of Laryngology and Otology along the lines created by the Rockefeller Foundation, erected in some convenient centre and linked up with all our clinical departments, where the coming generations of young specialists and teachers would extend their education, receive post-graduate instruction, and, at the same time, play their part in the advancement of the specialty.

We should co-ordinate our departments, therefore, and place our specialty in a position as high as that now occupied by internal medicine and by surgery. There is little that is new in what I have said, and many of the improvements which I have suggested have already been effected in other branches, and are even coming into force now in some of our departments. Let us apply these improvements more generally and advance our standard of education. I have faith in the future of the specialty. To carry through what has been outlined will entail increased effort on our part and on that of our successors, but, with the willing spirit, the way will be found. A difference of opinion may be legitimately expressed as to whether the changes suggested are the best that can be advocated in the interests of the specialty. To maintain, however, an attitude of complacency combined with a sense of complete satisfaction towards things as they exist, would, I think, inevitably lead to a halt in the onward march of progress. Let me conclude by quoting the words of one who spent the best years of his life in the interests of the medical profession, of which he was a distinguished member: "In education there is no finality. We cannot stand still in such matters. Every step which we take in the improvement of University education gives us a new platform from which to start, in order to make other and better arrangements."

## THE WORK OF SHERRINGTON ON THE PHYSIOLOGY OF POSTURE \*

By F. M. R. WALSHE, M.D., F.R.C.P., Assistant Physician,  
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TO those, unfamiliar with modern notions on the physiology of the nervous system, perhaps the main difficulty in understanding the beautiful researches of Magnus and de Kleijn on labyrinthine functions, will be the prevailing vagueness as to what is to be understood when we speak of muscle tone.

The definition which still too often passes muster, to the effect that tone is the state of active tension characteristic of living muscle in functional connection with the nervous system, is now realised to be profoundly inadequate in the light of modern knowledge.

It is a matter of pride that we owe to the English physiologist Sherrington the fundamental facts in this connection. In a series of now classic researches carried out during the past thirty years, he has revealed to us the physiological significance of muscle tone and the factors governing its maintenance. It had been hoped that Sir Charles Sherrington himself might have been able to be present at this Meeting to give a resumé of his work. This has proved impossible, and on my unworthy shoulders has fallen the task of presenting you, in the simplest possible terms, with a concise summary of his work.

Before Sherrington's time, experimental physiology had given very contradictory results, and even the existence of muscle tone was in question. The fundamental experiment, from which all subsequent investigations have arisen, was that in which, after transection of the brain-stem of the cat in the region of the tentorium, Sherrington found that certain muscles had entered into a state of increased tone—hypertonus—which provided an excellent medium for the examination and analysis of the phenomenon. The animal preparation, thus produced, is known as the decerebrate animal, and the transection is found to pass through the pons, cutting off the cerebral hemispheres *and* midbrain.

The increased tone is selective in its incidence, being confined to those muscles which maintain the animal in its natural

\* Paper read at the Summer Meeting of the Section of Otology, Royal Society of Medicine, held at Cambridge, 29th June 1923.



## Sherrington on the Physiology of Posture

standing posture, namely, the extensors of the limbs, neck, and back, and the elevators of the jaw and tail. This great physiological group Sherrington speaks of as the "anti-gravity" muscles, and its antagonists, the limb flexors; the flexors of the neck and back and the depressors of the jaw and tail are found to be reciprocally inhibited and atonic. At once the meaning of muscle tone becomes clear; it is nothing else than the basis of posture, and decerebrate rigidity, as the phenomenon is called, is reflex standing. We may, therefore, define muscle tone as the basis, the raw material, of posture.

The second fundamental observation lay in the discovery that muscle tone is a true reflex, dependent upon the integrity of the afferent nerve supply of the tonic muscle. If, by posterior root section, we deprive the muscle of its afferent nerve supply, at once it loses its tone. The reflex is, therefore, a deep or proprioceptive one, arising in the muscle itself.

If the brain-stem of the decerebrate animal be again divided at any level below that of the calamus scriptorius, the hypertonus at once disappears from the musculature, an observation which shows that the reflex arc concerned in the maintenance of tone is a long one, having its "centre" in the brain-stem, that is, in the pons and upper part of the medulla.

Sherrington found that if the decerebrate animal be planted on its legs, it can stand, and further, that its attitude can be modified by passive manipulation of the limbs, which tend to retain the new posture imposed upon them in this way. In other words, the tonically contracted muscle can maintain its tone at different lengths. If it be stretched, it keeps its new length, and, similarly, if its ends be approximated by movement at a joint, it remains shortened. These two reactions, the "shortening" and the "lengthening" reactions also occur when the limb actively takes up a new attitude under appropriate reflex stimulation, and they give to muscle tone the quality known as "plasticity." From another point of view they may be said to confirm the conclusion that muscle tone is a postural reflex.

Although the maintenance of tone demands the integrity of the muscle's afferent nerve supply, Sherrington made the interesting observation, out of which Magnus and de Kleijn's subsequent work has arisen, that the tone could be influenced, or modified, by impulses arising elsewhere in deep structures,

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muscles, tendons, and joints. Thus rotation of the head to one side increased the extensor hypertonus of the limb muscles on the side to which the animal's snout was turned, and diminished that of the opposite limbs. Other tone regulating influences take their origin in the labyrinths and in the muscles of the limbs.

We see, then, that there are two reflex mechanisms to be considered, that concerned in the maintenance and that in the regulation of muscle tone. The work of Magnus and de Kleijn has been devoted to the analysis of the latter and may be said to have solved the main physiological problems of postural regulation, because the tonic reflexes arising in neck, limbs and labyrinths are the reflex processes by means of which the animal normally takes up and maintains all those attitudes which are natural to it during life.

There are two elements in the co-ordination of movement, the phasic or movement element, and the tonic or postural element. Muscle tone is the basis of the latter, and its loss results in the grossest disorders of voluntary movement. All those disorders with which we are familiar as components of cerebellar ataxy may be regarded as the inevitable result of loss or diminution of postural tone. It is, therefore, clear that a precise conception of what the physiologist understands by muscle tone is essential, not alone to the comprehension of Magnus and de Kleijn's beautiful researches, but also to the study of all disorders of movement.

Interesting as these purely experimental observations are, they gain added importance to us if we can show that they can be applied to man. There are reasons for supposing that the so-called spasticity of hemiplegia and the extended form of paraplegia are physiologically, that is qualitatively, identical with Sherrington's decerebrate rigidity, and we should naturally expect to find associated with it some of these tonic reflexes, these regulating reactions, which Magnus and de Kleijn have described. In nearly every case of spastic residual hemiplegia they are, in fact, to be found. Thus, the associated movements of the paralysed limbs are identical in character with the tonic reflexes found by Sherrington to be produced by passive movements of the limbs of the decerebrate animal. In man, also, rotation of the head may give rise to variations in the attitude and in the tone of the paralysed arm. The associated reactions mentioned may be reversed in form by head rotation, or by

## Sherrington on the Physiology of Posture

variations in the position of the head in relation to space. Further, phasic reflexes, that is, reflex movements as opposed to reflex postures, may be modified in form by variations in the position of the head. Certain changes in the Babinski type of plantar response, to take but a single example, may be produced by this means.

In conclusion, we see how far knowledge has advanced from the simple definition of muscle tone as simply "a state of active tension" in a muscle, and, for our present purpose, we may speak of it appropriately as the basis of posture.

## EXPERIMENTAL PHYSIOLOGY OF THE LABYRINTH.\*

By A. DE KLEIJN, Utrecht.

I WISH to thank the members of the Section for the opportunity which they have given me of speaking about the work conducted in the Pharmacological Institute in Utrecht during the last ten years. My thanks are also due to Dr A. R. Tweedie and Dr F. M. R. Walshe for the excellent summaries of this work which they have given in the English Journals.

In 1875, Breuer, far outstripping the ideas of his contemporaries, gave it as his opinion that labyrinthine reflexes should be divided into two groups:—

- I. Reflexes responding to movements (reflexes of the semicircular canals).
- II. Reflexes resulting from position (reflexes of the otoliths).

This division is in entire accord with anatomical researches: on the one hand, the cristæ and cupulæ of the semicircular canals freely moving in the endolymph are adapted to react to movements of the head; on the other hand, the maculæ covered by the otolithic membranes with their greater specific weight are specifically adapted to react to changes in the pressure of these membranes produced by alteration in the position of the head in space.

It can be readily understood that this new division of Breuer, was not accepted by his contemporaries. Although, after his ingenious experiments, it was not possible to deny that the reflexes corresponding to movements must arise in the semicircular canals, his deduction of the existence of a new group of labyrinthine reflexes resulting from position, was not sufficiently supported by experiments to be generally accepted.

Breuer's experiments concerning the rotatory reactions and after-reactions on the head and on the eyes were so ingenious that, up to the present time, it has only been possible to complete his work by finding new details. Except for the past-pointing tests of Bárány, all our rotation-tests are only clinical applications of Breuer's experiments.

\* Paper read at the Summer Meeting of the Section of Otology, Royal Society of Medicine, held at Cambridge, 29th June 1923.

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Breuer considered the following as otolithic reflexes:—

(a) Progression reactions, (b) compensatory eye positions, (c) rotation of the head after unilateral labyrinth extirpation.

As to progression reactions, known only as subjective sensations in 1875, I hope to show you, later on, that these reactions cannot be considered as pure otolithic reflexes.

The knowledge of the compensatory eye positions was, in 1875, quite incomplete; sufficient investigations had not been made.

Most of the investigators of Breuer's time considered the rotation of the head after unilateral labyrinth extirpation to be caused by post-operative cerebral lesions. No method was known of examining separately the functions of the semicircular canals and of the otoliths.

Briefly, the opposition to Breuer's classification of the labyrinthine reflexes must be ascribed to the insufficient knowledge, in his time, of the *tonic* labyrinthine reflexes.

Forty years later, thanks to the brilliant investigations of Sherrington on decerebrate animals, it has been possible to find other tonic labyrinthine reflexes. Before passing on to the description of the different labyrinthine reflexes, I shall first discuss how it is possible to examine separately the functions of the semicircular canals and of the otoliths. This could evidently be done in the following way: either by extirpation of the semicircular canals alone, or of the otoliths alone. The reflexes arising in the extirpated part of the labyrinth would then be lacking, and the reflexes arising in the remaining part would be present.

Such experiments, possible on fishes, as is known from the investigations of Kubo, Benjamins, Maxwell and others, have not been carried out up to the present on mammals.

Wittmaack showed that it is possible to detach separately the otolithic membranes by centrifugalising normal guinea-pigs under ether narcosis at a rate of 1000 metres per minute. By this method, only the otolithic membranes are detached, the *sensory epithelium* of the maculæ remaining *quite intact* (Figs. 1, 2, 3). Hence the behaviour, on the one hand, of an animal with detached otolithic membranes, and on the other, that of an animal with paralysed extirpated maculæ, is not quite the same.

Special experiments have shown that the sensory epithelium of the maculæ of the utricle and saccule is in a permanent

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condition of stimulation. In normal animals with intact otolithic membranes, the condition of stimulation varies in different positions of the head in space, in proportion to the changes in pull or pressure of the otolithic membranes.

In an animal with detached otolithic membranes, there is a permanent condition of stimulation of the maculæ; change of position of the head in space does not, however, elicit a *change* of this stimulation as in normal animals, because the otolithic membranes are absent and cannot pull or press. On the contrary, in an animal with paralysed, extirpated maculæ there is no condition of stimulation at all.

As we have seen, up to the present time, it has not been possible in mammals to extirpate separately the different maculæ. However, during the last year de Burlet and Hofman in the Anatomical Institute in Utrecht have succeeded in preparing the different maculæ of several mammals by using for this purpose the operating microscope of Zeiss. Applying this method, it has recently been possible in the Pharmacological Institute to extirpate separately the saccular maculæ from living rabbits. The method can only be applied to the saccular maculæ, because the utricular maculæ are so closely connected with the semicircular canals that a separate extirpation is not possible without injuring the latter. Perhaps it may be possible to succeed in the following way:—Some months ago, while we were operating on a living rabbit it was intended to make a partial resection of the labyrinth. From the microscopical investigation it was found that only the cochlea had been removed and that the saccular nerve was cut through. We tried, therefore, to see if it were possible to cut through the different nerves (nerve from the saccule, nerve from the utricle, etc.) without opening the labyrinth. Experiments on skulls showed that this was possible, and in the near future such experiments on living rabbits will be undertaken.

We have seen that up to the present time the different labyrinthine reflexes can be examined separately by the method of Wittmaack, but we hope in the near future to be able to divide, with the aid of the operating microscope, the different nerves of the labyrinth without injuring the labyrinth itself.

If we turn now to the description of the different labyrinthine reflexes, we find that they may be classified in the following way:—



FIG. 1.—Labyrinth of a normal Guinea-pig. Sensory epithelium of saccule and utricle covered by the otolithic membranes.

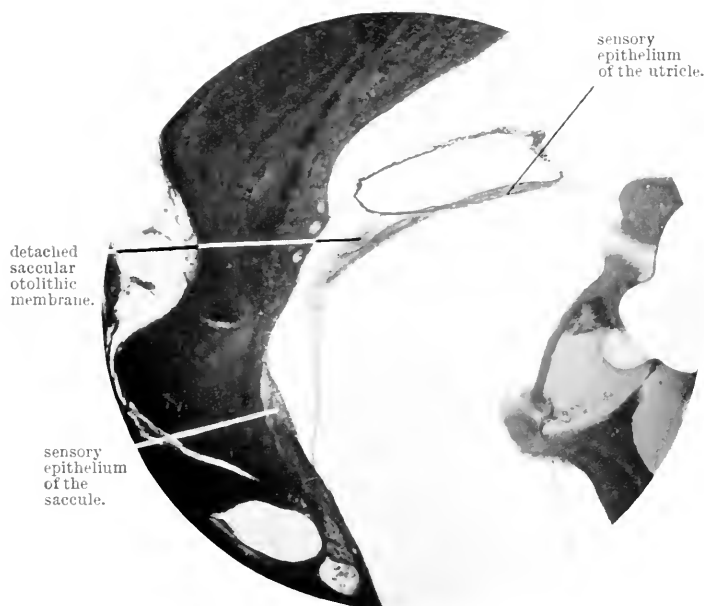


FIG. 2.—Labyrinth of a Guinea-pig after centrifugalising. Sensory epithelium of saccule and utricle without otolithic membrane. In the corner of the saccule the detached otolithic membrane. The detached utricular otolithic membrane is shown in Fig. 3.





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- I. Reflexes responding to movements (reflexes of the semi-circular canals).
  1. Rotatory reactions and after-reactions (with nystagmus), (*a*) on head, (*b*) on eyes.
  2. Progression reactions.
- II. Reflexes resulting from position (tonic reflexes, reflexes of the otoliths).
  1. Tonic labyrinthine reflexes on the body musculature.
  2. Labyrinthine "righting" reflexes.
  3. Compensatory eye positions.

This division agrees completely with the classification of Breuer, except that he considered the progression reactions to be reflexes of the otoliths. To this difference of view I shall revert later on.

## I. Reflexes Responding to Movement.

**1. Rotatory Reactions and After-Reactions, (*a*) on Head (*b*) on Eyes.**—As I mentioned above, Breuer himself described these reactions very exactly and all of us in our clinical work make so much use of them, that it is not necessary to describe them here.

**2. Progression Reactions.**—The chief progression reactions are the following:—

(*a*) *Lift Reaction.*—If, for instance, a normal animal is placed upon a board and the board moved slowly upwards, the limbs are flexed, while at the termination of the movement they are extended. The reverse occurs with a downward movement.

(*b*) *Toe-spreading Reflex.*—If we hold a guinea-pig in the air vertically grasping it with one hand about the axillæ, and the toes of the hind-limbs are stroked together, then, during any slight movement in a vertical direction, either upwards or downwards, there will occur a spreading out of the toes.

(*c*) *Springing Reflex.*—If an animal is held horizontally with one hand round the neck and the other round the loins, a sudden passive movement of the animal forwards and downwards will induce extension forwards of the limbs. This reflex is of great practical value to animals, as it enables them, when jumping down to the floor, to catch the weight of the body by the extended fore-limbs.

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All these reflexes are labyrinthine reflexes; they disappear after bilateral labyrinth extirpation. They are reflexes arising in the semicircular canals, because they persist when the otolithic membranes are detached.

Breuer and Mach thought that the semicircular canals could not react upon progression, on the ground that they form a system comparable to a closed vessel with rigid walls. However, the walls are not rigid; the endolymph is connected with the endolymphatic sacculæ, and the perilymph is enclosed in a wall with two elastic fenestræ (fenestra rotunda and fenestra ovalis). By means of a model, made by Ornstein and Burger in Utrecht, it was demonstrated, that in the circumstances above mentioned, the semicircular canals really can react upon progressive movements.

It may be possible, however, that progression reactions also arise from the otoliths. I use the word *may*, because we cannot make a control experiment. Removal of the semicircular canals separately, without injuring the otoliths, has not been possible, as mentioned before, up to the present time. As to how the otolithic membranes *might* produce progression reactions, I will show you by an example. At the end of the lift reaction upwards, when the movement is stopped, the utricular otolithic membranes will pull on the maculæ in consequence of their inertia and will produce by that means, as will be shown later on, an extension of the limbs. This is actually seen in the lift reaction at the termination of the movement upwards.

I believe, therefore, that the progression reactions occur through a combination of reflexes arising both in the semicircular canals and in the otolithic organs.

### II. Reflexes resulting from Position.

In considering tonic otolithic labyrinthine reflexes, we must be assured of the following points:—

- (a) That they are really *labyrinthine* reflexes, and therefore disappear after bilateral labyrinth extirpation.
- (b) That they are *otolithic* reflexes, that is to say, they disappear when the otolithic membranes are detached.
- (c) That they are *tonic*, that is to say, that their influence persists as long as a certain position of the head in space is maintained.

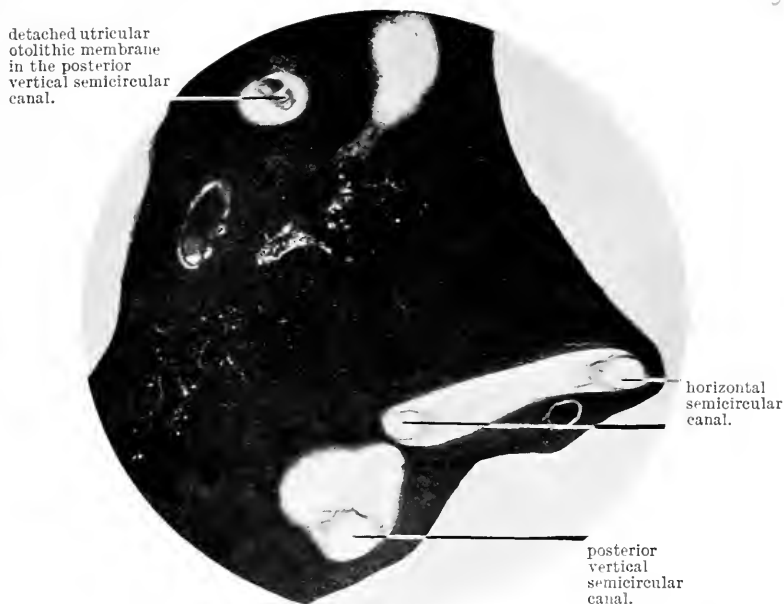


FIG. 3.

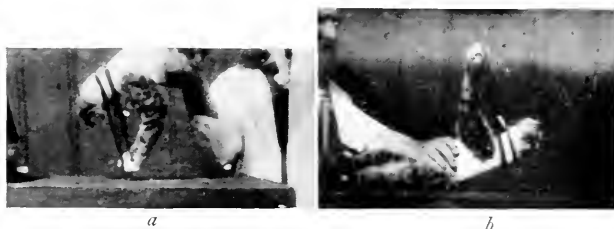


FIG. 4.—Decerebrate Cat. Spinal cord cut through, therefore only reflexes on the forelimbs. The head and trunk are fixed in a plaster cast. Cinema photographs.

*a.* Minimal position for the labyrinthine reflexes; flexion of the forelimbs. *b.* Animal in maximal position for the labyrinthine reflexes; extension of the forelimbs; the extension is very strong; it takes place against the pulling of an elastic cord.



FIG. 5.—Model of the Maculae (not in typical position).

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If we place such a model in the position for maximal extensor tone, it will be seen that, while the saccular maculae do not have any special position at all, the utricular maculae have a very typical position; they lie horizontally, the otolithic membranes pulling at the sensory epithelium. If we then place the model in the position for minimal extensor tone, the utricular otoliths again occupy a very typical position, whereas this is not the case with the saccular otoliths. The utricular otoliths lie horizontally, the otolithic membranes pressing on the sensory epithelium.

The utricular maculae also influence the *flexor* tone of the limbs: in the position for maximal extensor tone the influence on the flexor tone is minimal; in the minimal extensor position the influence on flexor tone is maximal. If one labyrinth only is extirpated, it is seen that the maximum and minimum positions and their influence on extensor and flexor tone remain the same, showing that each labyrinth is connected with the muscles of both sides. The utricular maculae also influence the tone of the neck muscles, the maximum and minimum positions being the same as for the limbs. There is one great difference, however; each utricular macula is only connected with the neck muscles of *one* side; this is one of the reasons why, after unilateral labyrinth extirpation, the head turns to the operated side.

I must now say a few words about the influence of tonic neck reflexes on the body musculature. Tonic neck reflexes arise when the position of the head in relation to the trunk is changed; they disappear after section of the dorsal cervical roots and can be investigated, free from complications, after bilateral labyrinth extirpation, or, by changing the position of the head only in the horizontal plane. (For instance, changing the position of the head by rotation when the animal is in the vertical position, by ventral flexion and dorsal flexion when the animal is in lateral position, or by lateral flexion of the head to one shoulder in animals in the normal standing position).

The tonic neck reflexes influence the tone of the muscles of the limbs nearly always in an asymmetrical manner; rotation of the head or lateral flexion of the head causes increase of extensor tone in the limbs on the side to which the snout is directed, and diminution on the side to which the vertex is directed (Fig. 6). Dorsal flexion of the head causes, in most animals, extension of the fore-limbs and flexion of the hind-

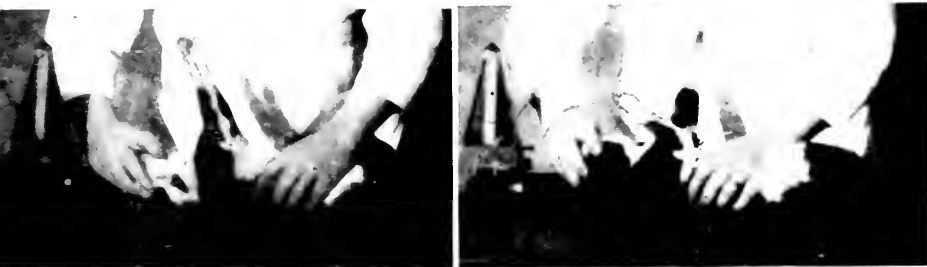


FIG. 6.—Decerebrate Cat. Spinal cord cut through.

*a*. Animal on its back: strong extension of the forelimbs. *b*. Rotation of the head; flexion of the right forelimb (on the side to which the vertex is directed); extension of the left forelimb (on the side to which the snout is directed).



FIG. 7.—Rabbit after Labyrinth Extirpation on the Left Side.



FIG. 8.—With the head brought into the natural position, the animal sits normally.



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limbs; ventral flexion of the head, on the contrary, causes flexion of the fore-limbs and extension of the hind-limbs. Tonic neck reflexes, therefore (and this is also true of tonic labyrinthine reflexes), cause, in many cases, those postures which are frequently assumed for various purposes by normal animals.

Inadequate knowledge of these tonic neck reflexes has resulted in many wrong conclusions. I shall only give you one example. After unilateral labyrinth extirpation you see a rotation and lateral flexion of the head to the operated side; the limbs on this side are flexed and adducted, the limbs on the other side extended and abducted (Fig. 7). This was understood to be a direct consequence of the unilateral labyrinth extirpation; in reality, it is only the result of tonic neck reflexes. If you bring the head into the normal position, then the extension and flexion, the abduction and adduction of the limbs disappear and the animal sits quite normally (Fig. 8).

*Combination of Tonic Labyrinthine and Tonic Neck Reflexes.*  
—We have spoken about tonic labyrinthine and tonic neck reflexes separately. If you bring the head of an animal into a new position in space, you nearly always change the position of the head both in relation to the horizontal plane and in relation to the trunk.

Generally we can say that, in all positions, the result of the combined influences is always the algebraic sum of the influences caused by the tonic labyrinthine reflexes and by the tonic neck reflexes.

Another example: let us suppose that the animal lies in the lateral position (*i.e.* on its side), with the head symmetrical to the trunk. If we now turn the head so that the snout is directed upwards, we have the following situation developed. Tonic labyrinthine reflexes increase the extensor tone in all four limbs, because the utricular maculæ are brought into a position nearer the maximal for extensor tone; tonic neck reflexes influence the extensor tone in such a way, that in the limbs which lie uppermost it is increased (the limbs on the side to which the snout is directed), while in the under limbs it is diminished (the limbs on the side to which the vertex is directed). The result will be that the uppermost lying limbs gain in extensor tone both from the labyrinths and the neck, and they will show a very strong extension; the under limbs get an increase of extension from the labyrinths, and diminution of extension from the neck. Now, if the labyrinthine

influence is stronger, they will become more extended, whereas if the neck influence is stronger, they will become less extended, and if the labyrinthine and neck reflexes are equally strong nothing will occur.

Tonic labyrinthine and tonic neck reflexes can be studied very well in all decerebrate animals. They can also be studied in normal animals with few voluntary movements, such as rabbits, guinea-pigs, etc., or in animals with many voluntary movements, like cats, dogs, monkeys, etc., if they are under narcosis.

*Clinical Observations on Tonic Labyrinthine Reflexes.*—A complete investigation of these reflexes in patients is very difficult, because to exclude tonic neck reflexes it is necessary to fix the head and trunk in a bandage. Therefore, it is really only possible in children. Up to now, four cases have been observed in the Neurological Clinic in Utrecht in children with severe cerebral disturbances. In two cases, with amaurotic family idiocy, the maximum and minimum positions were practically identical with those found in animals (Figs. 9 and 10); in two other cases, the maximum and minimum positions were found in the same situations, but reversed, maximum position for the extensor tone being with the line of the mouth about  $45^{\circ}$  below the horizontal plane, and the minimum position with the line of the mouth about  $45^{\circ}$  above the horizontal plane.

*Tonic neck reflexes* have been found by different examiners in many patients with severe cerebral disturbances. The reflexes are practically identical with those found in animals (Fig. 11).

During recent months two very interesting papers by Simons and Walshe have appeared concerning tonic neck reflexes in the so-called "associated movements" of hemiplegia. The best way in which to elicit these "associated movements" in a paralysed leg, is to cause the patient to make a forcible contraction of the normal arm. Tonic neck reflexes can then be produced in the paralysed legs by changing the position of the head in relation to the trunk. By a very careful analysis of the different reflexes observed in his patients during these "associated movements," Walshe was able to demonstrate also tonic *labyrinthine* reflexes, and a combination of tonic labyrinthine and tonic neck reflexes; all were practically identical with those found in animals. The investigations





FIG. 9.—Child with amaurotic family idiocy. Cinema photograph. Child in "maximal" position for the labyrinthine reflexes: extension of all limbs.



FIG. 10.—Same child as in Fig. 9 in "minimal" position for the labyrinthine reflexes; passing off of the extensor tone.



FIG. 11.—Child with Idiocy. Rotation of the head to the left. Flexion of the right limbs (on the side to which the vertex is directed); extension of the left limbs (on the side to which the mouth is directed).



FIG. 12.—Labyrinthine "Righting" Reflexes. Guinea-pigs held by their loins free in the air. Normal guinea-pig (right): the head is brought to the normal position. Guinea-pig without righting reflexes (left): head in lateral position.



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of Simons, and especially those of Walshe, are important because they have shown us how to study these reflexes in conscious patients.

**2. Labyrinthine "Righting" Reflexes.** — The following experiment is well known: If a normal guinea-pig is held in the air by its loins and the trunk is brought into different positions in space, the head always tends to remain in the normal position and does not conform to the different positions of the trunk. Breuer showed that this phenomenon must be ascribed to labyrinthine reflexes, because after bilateral labyrinth extirpation it disappears (Fig. 12). These labyrinthine "righting" reflexes acting on the head can be studied in normal guinea-pigs and rabbits; in all other animals the cerebral hemispheres must first be removed, but the midbrain (Magnus) especially the nucleus ruber, must be left quite intact because the centres of these reflexes are situated there (Rademaker). The animals without hemispheres are incapable of voluntary movements, but otherwise their behaviour is that of normal animals, and, what is most important, the muscle tone is not changed.

If we wish to discover in which part of the labyrinth these reflexes arise, it is useful to investigate them after unilateral labyrinth extirpation.

After unilateral labyrinth extirpation the righting reflexes cause the animal to turn the head into such a lateral position that the intact labyrinth is uppermost. In this position the animal is quiet, the righting reflexes being minimal. If the intact labyrinth is underneath, then the righting reflexes are at their maximum and the animal does not rest until it has succeeded in bringing the intact labyrinth uppermost into the minimum position again. If we now bring the model of the labyrinth into the maximal position we can see that the macula of the saccule has a "typical" position, whereas the utricular macula has not a typical position at all. The macula of the saccule lies horizontally: the otolithic membrane *pulls* at the sensory epithelium; in the minimal position, the macula of the saccule also lies horizontally, but the otolithic membrane *presses* on the sensory epithelium. *With regard to the labyrinthine righting reflexes, it is proved therefore, with certainty, that the strongest stimuli occur when the otolithic membrane is pulling at the sensory epithelium.*

When both labyrinths are intact, the head is always brought

back from an asymmetrical to a symmetrical position; that is to say, the head only comes to rest in such a position that the stimuli arising from both saccular maculæ are equally strong. There is one difficulty: the head comes to rest not only in a symmetrical position, but also in a very typical position, the vertex above, the lower jaw below, and the occipito-incisor axis of the head about  $35^\circ$  below the horizontal plane. Whether the saccular or the utricular maculæ are the cause of this "typical" position, we do not know; perhaps we may say, that the head comes to rest in a position in which both the saccular maculæ are placed symmetrically, and both the utricular maculæ occupy a minimal position (the otolithic membranes pressing on the sensory epithelium).

After bilateral labyrinth extirpation all midbrain animals, and such normal animals as have few voluntary eye movements, lose their labyrinthine righting reflexes. Normal animals, however, with a wide range of voluntary eye movements (dogs, cats, monkeys, etc.) held free in the air after bilateral labyrinth extirpation, right their head by using their eyes. The *optical* righting reflexes disappear when the animals are blindfolded.

Magnus has described other groups of righting reflexes:—

(a) If a guinea-pig is held in the air by its loins in the lateral position, the head is brought into the normal position, and not only the head but also the trunk as far as possible. This is caused by *righting reflexes arising in the neck and acting on the trunk*.

(b) A further group of righting reflexes are those *arising in the body walls and acting on the head*. These can be examined after bilateral labyrinth extirpation. In these circumstances, a guinea-pig does not bring its head into the normal position when it is held free in the air in the lateral position. But, when the same animal is laid on its side on a table, it does bring its head immediately into the normal position. That these reflexes arise from an asymmetrical stimulation of the body walls is demonstrated by the following experiment: when a board is laid upon the free upper body wall these reflexes disappear, because the asymmetry of the stimulation of the body walls has ceased.

(c) *Righting Reflexes arising in the Body Walls and acting on the Trunk and Limbs*.—If a guinea-pig is laid on its side and the head is fixed in this position, the animal rights its trunk and limbs immediately and brings these into the normal

# Experimental Physiology of the Labyrinth

position. The experiment with a board shows that these reflexes also arise from asymmetrical stimulation of the body walls.

We have thus five different groups of righting reflexes—three acting on the head (labyrinthine reflexes, optical reflexes, and reflexes arising in the body walls) and two acting on the trunk and limbs (neck reflexes, and reflexes arising in the body walls).

With these different groups of righting reflexes the animal is able to bring its head, trunk and limbs from any abnormal position back to the normal.

*Clinical Observations.*—Till now labyrinthine righting reflexes have been observed in one case only, that of a child with anencephaly (Neurological Clinic, Utrecht). The child, held by its trunk in the air in the lateral position, immediately brought its head again into the normal position.

**3. Compensatory Eye Positions.**—The study of the compensatory eye positions (tonic labyrinthine reflexes on the eye muscles) dates from about a century ago. Interesting investigations have been made by Hunter, von Graefe, Högyes, etc.; all, however, made the same mistake. They did not distinguish the compensatory eye *movements*, responding to movements of the head and arising in the semicircular canals, from the compensatory eye *positions* resulting from the special position of the head in space and arising in the otoliths.

Breuer, however, took the right view of this question in his already mentioned classification of the labyrinthine reflexes. The compensatory eye positions can be studied in normal animals with two separate visual fields (and, in consequence of this, with few voluntary eye movements) such as rabbits, guinea-pigs, etc. In order to study normal animals with binocular visual fields and many voluntary eye movements (cats, dogs, monkeys, etc.), narcosis is necessary. These reflexes are important, because they are the only tonic labyrinthine reflexes which can be measured exactly.

The best way in which to study them in rabbits is as follows:—The whole animal is tied immovably to a board and the head is firmly held in Czermak's head-clamp, so that its position is rigidly fixed in relation to the trunk. The board can be brought into the different positions in space by being turned round in different axes. To the head-clamp of Czermak a frame with two thin wires is fixed, and under cocaine a cross

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is branded on the cornea. Opposite to the animal a cinema kodak is fixed on the board to photograph the positions of the eyes in different positions of the head in space. If we now photograph the corneal cross and the wires together, we can record exactly and easily changes in the vertical, lateral and rotatory positions of the eye (Figs. 13 and 14).

We know of two varieties of labyrinthine compensatory eye positions—rotatory and vertical.

(a) *Rotatory Compensatory Eye Positions.*—There is only one position of the head in space in which the rotatory displacements of the eyes, with the upper pole towards the nose,

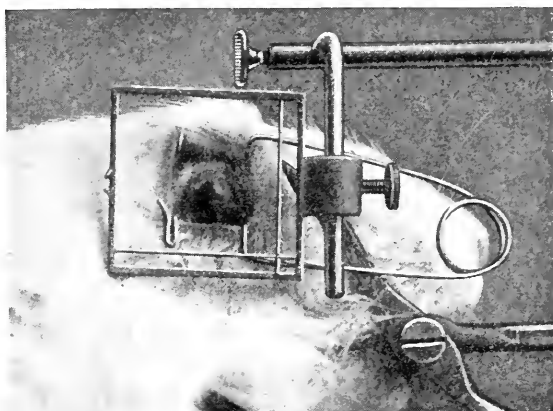


FIG. 13.

are maximal: namely, with the head in the vertical position, the snout above. There is only one position of the head in space in which the rotatory displacements towards the ears are maximal: namely, with the head in the vertical position, the snout below. We do not know which part of the labyrinth originates the rotatory compensatory eye positions. If we take the model of the labyrinth, then it becomes clear that, in the two above mentioned positions, neither the saccular nor the utricular maculae have a typical position. The supposition, some time ago suggested by Magnus and myself, that they arose in the so-called corners of the saccular maculae (the little part of the saccular maculae innervated not by the saccular but by the utricular nerve) cannot be right, taking into consideration the latest anatomical investigations of de Burlet and de Haas.

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Both eyes always undergo a rotatory displacement in the same direction in the sagittal plane of the head. After unilateral labyrinth extirpation, the rotatory eye displacements are only diminished. They are not changed in character.

(b) *Vertical Compensatory Eye Positions*.—Concerning vertical compensatory eye positions, I can only repeat what was said about the labyrinthine righting reflexes. If we want to know in which part of the labyrinth these reflexes arise, it is practical

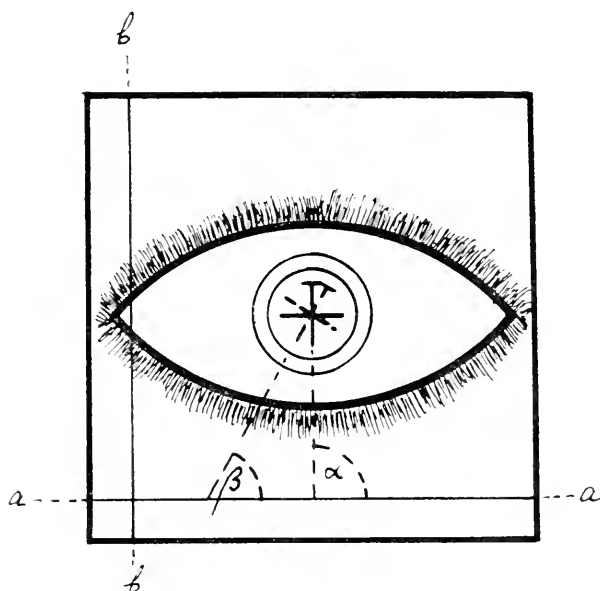


FIG. 14.—Cross on the eye in two different positions in two different positions of the head in space. The rotatory displacement is the difference of angle  $\alpha$  and angle  $\beta$ .  $aa$  and  $bb$ =thin wires of the frame.

to study them after unilateral labyrinth extirpation. With respect to these compensatory eye positions we can again prove with certainty, that the strongest stimuli occur when the saccular macula lies horizontally, the otolithic membrane pulling at the sensory epithelium; that is to say, the vertical compensatory eye positions are maximal in the lateral position of the head, with the intact labyrinth underneath; the vertical eye positions are minimal or zero in the lateral position of the head, with the intact labyrinth uppermost. Both eyes always undergo vertical displacement in the same direction in the frontal plane of the head, *i.e.* in the right lateral position

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of the head, the right eye is deviated upwards, the left eye downwards (both having moved clockwise, seen from the front).

When both labyrinths are intact, we can say in general, as much with respect to the rotatory as to the vertical eye positions, that if the head passes from one position into another, the eyes perform such movements to attain their new position in the orbits that they, as it were, try to retain their original position in space. That they only *try* to retain their original position in space, I shall demonstrate to you by the following example. If we bring the head from a position with the line of the mouth in the horizontal plane, into a vertical position with snout below, the head moves through  $90^\circ$ . If the eyes are to remain in their original position in space, they must undergo a compensatory rotatory displacement also through  $90^\circ$ ; really, the movement is only through about  $70^\circ$ . What is the physiological gain from these compensatory eye positions? To elucidate this, it is necessary first to consider tonic neck reflexes on the eye muscles.

These reflexes were discovered, in 1907, by Bárány. He showed that tonic reflexes on the eye muscles not only arise when the position of the head in space is changed, but also when the position of the head is altered in relation to the trunk. He studied, however, these reflexes on normal rabbits with intact labyrinths and could not therefore make an exact analysis. Tonic neck reflexes can only be studied free from complications after bilateral labyrinth extirpation, or, by changing the position of the head only in the horizontal plane. (They disappear after section of the posterior cervical nerves.) Special experiments have shown, that, if we fix the trunk of a rabbit after bilateral labyrinth extirpation and bring the head into different positions in space, the tonic neck reflexes always produce the same effect on the eye muscles as do the tonic labyrinthine reflexes; that is to say, if the head is brought into another position, the eyes always try to retain their original position in space.

These compensatory eye positions caused by the tonic neck reflexes are much less in degree than those caused by the tonic labyrinthine reflexes. It is by the combination of these two groups of tonic reflexes that it becomes possible for a rabbit to change the position of its head, without altering the position in space of the eyes and, therefore, without alteration in the visual fields.



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Special experiments showed that a rabbit can move its head from the normal position into other positions in the sagittal plane to the limit of about  $45^{\circ}$  upwards and  $45^{\circ}$  downwards, in the frontal plane by rotation to right or left, up to about  $20^{\circ}$ , and in the horizontal plane, up to about  $17^{\circ}$  in each direction (this last only through tonic neck reflexes) without changing the visual fields.

The striking co-operation of different reflexes is still much greater. If the animal wishes to bring its head into another position, it must first make a movement: this movement reacts upon the eyes by compensatory eye movements arising in the semicircular canals; when the head becomes stationary in its new position, this special position reacts upon the eyes by compensatory eye positions arising in the otoliths and neck. In other words, the visual field remains unchanged during the movement, in consequence of reflexes arising in the semicircular canals, and, after the movement, in consequence of reflexes arising in the otoliths and neck. This only concerns animals with two separate visual fields; other animals, as cats, dogs, monkeys, etc., and also man, do not fix their visual fields by labyrinthine and neck reflexes, but by optical reflexes.

*Clinical Observations on Tonic Neck Reflexes on the Eye Muscles.*—Clinical observations regarding these reflexes are very seldom possible. Only two cases have been described by Simons in Berlin, and two were observed in the Neurological Clinic in Utrecht in patients with tumour of the brain. The best way to study them is by fixing the head and bringing the trunk into another position in space.

*Labyrinthine Compensatory Eye Positions.*—These reflexes have a great theoretical and practical importance. They are the only *tonic* labyrinthine reflexes which we can study in normal persons and can accurately measure. In studying these reflexes we must remember, however, that the eyes in man are placed in the frontal plane, and, therefore, we get in lateral positions of the head rotatory compensatory eye positions instead of vertical ones, as in the rabbit. In different positions of the head in the sagittal plane, we get vertical eye positions and not rotatory ones as in the rabbit.

We do not know in which part of the labyrinth the vertical compensatory eye positions arise. The rotatory compensatory eye positions, from analogy with the experiments on animals, in all probability, arise in the saccular maculæ. Therefore, it is

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of great importance to determine the rotatory eye positions in patients, because it is the only way to gain a knowledge of the functions of the otoliths, particularly those of the saccule. Up to the present time, we have only two *objective* methods at our disposal for measuring the rotatory compensatory eye positions in man: the method of Bárány and the method of van der Hoeve.

The apparatus of Bárány is known to all; it is very expensive, and, besides, it is only possible with this apparatus to investigate the combination of tonic labyrinthine and tonic

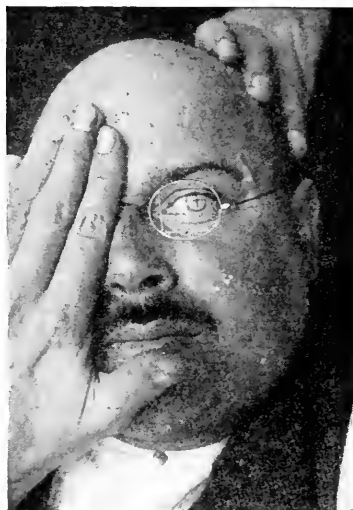


FIG. 15.

neck reflexes on the eye muscles, the position of the iris being examined in different inclinations of the head to the shoulder. By this method, not only is the position of the head in space changed, but also the position of the head in relation to the trunk. The apparatus of van der Hoeve is only applicable to patients with astigmatic eyes.

A simple method of measuring the compensatory eye positions in patients is the following, and it is similar to the one used in animals. A pair of spectacles, without glasses, but with two thin cross-wires instead, is placed before the eyes. A cross marked upon the cornea is necessary. This can be made by cutting from the dried shell-membrane of an egg round pieces as large as the cornea, and marking on these

# Experimental Physiology of the Labyrinth

membranes a cross. One of these marked discs is placed on the cornea (after applying cocaine), where it remains by adhesion without injuring the eye. If we now photograph the eye and the frame together, we can measure all displacements of the eyes as easily as in animals (Fig. 15).

If we wish to investigate the rotatory compensatory eye positions, it is best to examine them in the normal and in the two lateral positions of the head in space; in all these positions, the symmetrical position of the head in relation to the trunk must not be changed at all so as to exclude tonic neck reflexes on the eye muscles.

*To summarise:* we have seen that the different tonic labyrinthine reflexes do not play separately a great physiological rôle; they do so in combination with other reflexes. Tonic labyrinthine reflexes on the body musculature combined with tonic neck reflexes are of great importance in the different postures of normal animals. Labyrinthine righting reflexes combined with various other groups of righting reflexes cause the animal to bring back its head, trunk and limbs from any abnormal position into the normal. Tonic labyrinthine reflexes combined with tonic neck reflexes affecting the eye muscles, and combined with reflexes arising in the semicircular canals, make it possible for the visual field to remain unchanged when the animal moves its head from the normal into some other position in space.

There is nothing new under the sun. In 1875, Breuer gave us the classification of the labyrinthine reflexes in two special groups, and at the same time he said that if you throw a frog into the water after bilateral labyrinth extirpation, the animal will be absolutely disorientated, because the labyrinths, the sensibility of the body walls, and the eyes do not functionate at all. Thus, he expresses in a few words exactly what I have told you to-day in many words.

# SOCIETIES' PROCEEDINGS

## ROYAL SOCIETY OF MEDICINE—SECTION OF OTOTOLOGY

SUMMER MEETING, CAMBRIDGE

June 29, 1923.

*Chairman*—Sir CHARLES BALLANCE, K.C.M.G.

**The Work of Sherrington on the Physiology of Posture.**—  
F. M. R. WALSH, M.D.

**Experimental Physiology of the Labyrinth.**—Dr A. DE  
KLEIJN, Utrecht.

The papers are published in the *Journal of Laryngology and Otology*, December 1923, pp. 642 and 646.

### DISCUSSION.

Sir JAMES DUNDAS-GRANT said that much of what we had heard was new to him, and Dr de Kleijn had raised so many points that it would have been most difficult to grasp them had it not been for the admirable way in which Mr Tweedie had already presented much of the matter to us. As practical people we looked for the application of these reflexes in our ordinary work. We had a good deal of knowledge of the dynamic reflex produced in the semicircular canals, but the complications arising from the other static reflexes were still unfamiliar to us. The question asked by many of us was, "Why was it that after the compensatory movement we had the return movement?" that is to say, why did we get the "jerk" of the nystagmus after the "slow drag"? He (the speaker) had read with interest the description of the experiments in which Dr de Kleijn cut through all the motor nerves of both eyes except the left sixth, and detached the left external rectus from the eyeball, connecting it with a lever so that a tracing of its movements could be obtained. He removed the cerebral hemisphere and the brain-stem down to the anterior corpora quadrigemina; when he applied cold to the opposite ear, he obtained the slow drag on the part of the left external rectus followed by the jerk. That was supposed to test whether the jerk of the return movement was of cerebral origin; he (Sir James) confessed that he could not see how the experiment exactly proved it.

There had been some further experiments made on the brain in which the bone had been removed from the frontal region and caloric stimuli applied there: the results had been very much the same as those obtained by stimulating the labyrinth. While he expressed his great admiration of Dr de Kleijn's description of his operation, he would point out that the latter had not referred to Ewald, whose labours were not forgotten, and from whom much illuminating information had been derived.

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Mr SYDNEY SCOTT asked if Dr Walshe, in connection with his observations, could say whether there was an alteration in Babinski's reaction in hemidecerebrates, when the positions of head and trunk were altered in space without flexing the neck?

In regard to the demonstration to-day, he felt that all must greatly admire Dr de Kleijn's brilliant piece of work and investigation. To be able to destroy the otolithic membrane by centrifugalisation, without damaging the semicircular canals, enabled the observers to isolate the functions of the saccule and utricle from those of the semicircular canals. He had shown that the changed reflexes after centrifugalisation were really due to injury to the particular parts of the labyrinth, and not, as some might possibly suppose, to injuries to brain tissue, or to the labyrinth as a whole. As Dr Gray had said "the human labyrinth is virtually a closed cavity," for we found that pressure-changes produced in the labyrinthine cavity as a whole could be estimated manometrically by inserting glass capillary tubes filled with coloured fluid. The manometric readings showed that the extreme mobility of the stapes caused a range of movement equal to quite 3 or 4 cm. (in a tube of the calibre of the superior semicircular bony canal). Unilateral obstruction in the Eustachian tube of an intact tympanum with a mobile stapes could lead to appreciable differences of the intra-labyrinthine pressure, comparing one side with the other. These facts had a bearing on the elucidation of certain forms of vertigo.

In the class of vertigo now under consideration, all the canals of the labyrinth reacted normally: the tympanum was intact: hearing for low tones was preserved: one Eustachian tube was inefficient. The vertigo coincided with this inefficiency. Dr de Kleijn would no doubt allow him to draw attention to a case that was under his observation some five years ago, that of a young man who had an extremely obstinate obstruction in the Eustachian tube of the left ear. He saw him every day in hospital in France, but it was about a week before he succeeded in inflating that very obstinate ear. At last when the air went in, the patient was seized with vertigo and nystagmus to the left. His head became inclined to the right, and the face was turned to the right. He (the speaker) kept the catheter in place and waited till the vertigo ceased, then gave one more blow, and, to his astonishment, the vertigo returned more violently, the head moved in the opposite direction, and the patient showed intense nystagmus to the right. However, the attack stopped in a moment, and everything untoward disappeared. That was not his only observation, because he had opportunities of carrying out these tests every day for about three weeks. When the drum membrane was invaginated from external atmospheric compression, and suddenly released, the head movement was always in one direction; when the tympanum was distended, the head moved in the opposite direction. F. S. Lee's investigations on elasmobranchs showed that he obtained eye-movements in one direction when he pressed *gently* on the ampullary nerve, and, when he pressed harder, the eye-movements were in the opposite direction. There seemed to be a parallel with Lee's observations and clinical findings in connection with the differences in pressure which are transmitted to the normal labyrinth from the tympanum.

Mr Scott wished to raise the question of the influence of retinal reflexes

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on the tonic reflexes, which he believed had been erroneously attributed to labyrinthine stimuli, though we were acquainted with the forced movements of individuals who had a prism placed in front of the eye. During investigations on flying, he had observed that slow rotation, as in a slow spin of an aeroplane, could set up forced movements of the limbs. Many experienced airmen had to close their eyes or avoid looking at the ground, if in a spin, in order to avoid these forced movements. It was a most important matter in connection with flying, but one to which little attention seemed to have been paid.

Dr ALBERT A. GRAY thought that the reason for reserve in making definite statements as to the relationship of the different structures in the vestibule was due to the difficulty in being sure of one's facts. For the most part the membranous structures were floating in a fluid which bathed them on both sides. Consequently, when the preparations were put into alcohol, distortion was almost certain to occur, with the result that incorrect judgments were formed in regard to the anatomy of the organ. Such an error was made by Frau Anna Kraus in stating that the *canalis reuniens* was a closed tube in the adult human subject. As a matter of actual fact, the *ductus cochlearis* in the adult human subject could be injected from the *saccus endolymphaticus*, if the injection were made before the preparation had been subjected to the influence of hardening and dehydrating agents.

He wished to pay the highest tribute of admiration to the work which had been carried out by Dr de Kleijn and his colleagues at Utrecht. The work opened up a new field not only for the otologist, but for the physiologist and the physician. It explained many of the curious symptoms which occurred in diseases of the labyrinth and also in those which affected the cerebellum. In addition, it would enable clinicians to make more accurately the diagnosis of diseases affecting these parts.

Mr ALEXANDER R. TWEEDIE said it was most gratifying to him to find his friend, Dr de Kleijn, before the Section, giving a first-hand demonstration of the work being conducted by Professor Magnus and himself in Utrecht on the otolithic and allied reflexes, an account of which he (Mr Tweedie) had endeavoured to give, very imperfectly, on his return from Utrecht in the autumn of 1921.\*

Dr de Kleijn had taken infinite trouble in showing him all that he possibly could in his laboratory.

In referring to Dr Walshe's communication, Mr Tweedie pointed out that the particular aspect of the specialty, which was being discussed to-day, was inseparably associated with the nervous system, that it was not only important to receive occasionally the views of neurologists on these matters, but also that it was only by very close and constant collaboration with them that we should be able to progress in our knowledge of this subject. There was already established in France the "*Société d'Oto-Neuro-Oculistique de Strasbourg*," which was only concerned with phenomena of interest to these particular specialties. He thought that the example of the French should be followed, and every opportunity taken for obtaining assistance by collaboration with the oculist and neurologist.

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\* Proceedings, 1921-22, xv. (Sect. Otol.), pp. 15, 19.

# Royal Society of Medicine

The labyrinth appeared to be essentially an organ for presiding over balance and progression, and further, according to one theory, it was primarily stimulated in fishes by sensations received by way of the "lateral line." He believed that, in the future, we should find the missing links between the association of the "lateral line" with the labyrinth and the development of the cochlea.

The main point at issue, as had been mentioned, was the clinical significance of this work. Accounts of several cases, in which these phenomena could be demonstrated, had already been published by Professor Magnus and Dr de Kleijn, and to these he had referred in his original report to the Society.\* He (the speaker) was pleased to think he had already had cases of intracranial lesions, in which certain of these phenomena could be demonstrated, and he had had other patients with vertigo and with raised blood pressure, probably hypersensitive cases, in whom nystagmus could be induced by an altered position of the head in space; but whose responses to the routine tests of the semicircular canals were normal.

He believed that we should regard the otolithic apparatus in man as essentially a degenerative organ, normally of extremely little importance, and only becoming evident, so to speak, when involved in pathological disturbances. This view he thought had already been suggested by the description Dr Gray had given of the labyrinth of various fishes, birds, and animals, indicating its gradual decadence as we ascended the animal scale, and it was also supported by the fact that the otolithic reflexes were said to disappear in normal children after the age of three months, and that they thereafter, as yet, could only be elicited in cases with intracranial lesions and other pathological conditions. One reason for this gradual degeneration of the otolithic apparatus was, he submitted, the higher development of other senses—alluded to by Dr Hartridge—as the sense of touch, sight, and above all volition became elaborated, we learned to depend perhaps more on the greater efficiency of these senses, rather than be governed by an organ which automatically controlled the movements of the lower animals. It was most interesting, in this connection, to note the results of certain very practical experiments that had already been undertaken. He reminded his audience of the account by Mr Sydney Scott of his personal investigations in an aeroplane (*Journal of Laryngology*, 1920, No. 8), where he found that observers, if blindfolded, lost their sense of position in dense clouds. Similar experiments were also conducted in Holland by van Wulfften Palthe, who came to the conclusion that the vestibular organ was of no special significance to the aviator, and did not enable him to steer an aeroplane in clouds or mist (*Acta Oto-Laryngologica*, vol. iv.). This attitude of "disregard" towards the perceptions received by way of the eighth nerve was not confined to its vestibular branch: audition was largely a matter of "disregarding" the many sounds which we had gradually learned to ignore. Indeed it was only by these means that we were able to regulate what we heard in contradistinction to the methods we could adopt in respect of our other senses, where we had the opportunity, for example, of contracting our pupils, or even closing

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\* Proceedings, 1921-22, xv. (Sect. Otol.), p. 24.

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our eyes altogether against excessive light or objectionable sights, and in the case of our sense of smell, holding the nose to avoid offensive odours.

Dr Gray had alluded to the old experiments of "hypnotising" hens by laying them down, and drawing a chalk line from the beak. These experiments had been made as early as the seventeenth century, and amongst the various animals on which they were carried out, it was stated that fish, if turned on their back, and undisturbed, could be induced to lie still in that position. Although rather incredulous, he (the speaker) found to his surprise that with very little manipulation he could keep a goldfish in a bowl of water turned on its back. It seemed quite reasonable, therefore, that these so-called instances of "hypnotising" animals must really be otolithic reflexes as suggested by Dr Gray.

**The Ear as Morphologically an Apparatus for Perceiving Depth below Sea-level: An Explanation of the close Anatomical Association of Cochlea and Vestibule**—H. HARTRIDGE, M.D., Fellow of King's College, Cambridge.—The reason for the close anatomical association of structures so different in their physiological purposes as, on the one hand, the semicircular canals and otolith organs, and on the other, the cochlea, has long been a matter for conjecture. The explanation here advanced is that the mammalian organ of hearing subserved in the ancestors of mammals the function of perceiving depth below the water surface, and was, therefore, associated with the semicircular canals and otolith organs in the identification of position and direction of travel.

This hypothesis is supported:—

- (a) By the close mechanical analogy between the auditory apparatus of mammalia and the depth controlling gear in the naval torpedo, and
- (b) By the fact that in certain fish (Siluridæ) a mechanism is found consisting of ossicles, which connects the internal ear and the swim bladder. There is strong evidence that this is used for the perception of depth and not for audition.

*Analogy with Naval Torpedo.*—In the naval torpedo there are two mechanisms which operate together to control the depth at which the projectile shall travel beneath the surface of the water (1) a pendulum, (2) a hydrostatic membrane.

The former mechanism under the influence of gravity records any deflection that the long axis of the torpedo may make with the horizontal, and if such a deflection exists it turns the horizontal rudders in such a direction that the deflection tends to be corrected.

The hydrostatic membrane is a sheet rubber diaphragm situated in the side of the torpedo, being in contact with the water on the outside and on the inside with the air-filled interior. If the torpedo is at a depth below the surface the hydrostatic pressure tends to press



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the diaphragm inwards, but this motion is resisted by a spring. If the torpedo is at the correct depth at which it is required to travel, the hydrostatic pressure produces a force on the diaphragm that is just balanced by the force exerted in the opposite direction by the spring; but if the torpedo gets too deep or too shallow, the forces no longer balance and the diaphragm is pressed inwards or allowed to move outwards respectively, and this causes appropriate deflection of the rudders. Experiment shows that either mechanism by itself causes an alternate deflection of the torpedo from the straight line, because of back-lash and friction. But it is found that if both pendulum and hydrostatic membrane operate together, that the one eliminates the tendency to deflection introduced by the other, and the torpedo is thus caused to travel along a straight path at a given distance below the surface.

Applying these conclusions to the fish, it would seem clear that for the proper direction of path in three dimensions of space, at least two mechanisms would be required, namely, one to give information concerning depth below surface, and one to be influenced by gravity, and therefore to show deflection from the horizontal axis. Now the latter mechanism has long been identified as the otolith organ; the hypothesis advanced is that the tympanum, middle ear, and cochlea are to be identified as the depth-recording mechanism.

The tympanum is on this view the counterpart of the rubber hydrostatic membrane of the torpedo. The ossicles are the counterpart of the levers which convey the motion of the diaphragm under varying hydrostatic pressure to the rudder control mechanism, the stapedius muscle acting as the spring which in the torpedo balances the force produced on the diaphragm by the hydrostatic pressure. In fish, the homologue of the cochlea, with its basilar membrane, hair cells, and rods of Corti, is on the above view the mechanism by which the changes in position of the hydrostatic membrane (caused by changes in depth) are perceived by the sending of corresponding stimuli up the cochlear branch of the eighth nerve.

*Mechanism of the Ear in Fish.*—It is an essential feature of any mechanism for recording changes in hydrostatic pressure, that one side of the diaphragm should be exposed to the fluid pressure (in this case water), while on the other there should be a readily compressible fluid such as a gas or air. And, further, since the gas or air is liable to be absorbed, there must be means provided of renewing the supply. In the case of shallow water fish and most reptilia, the supply of air in the middle ear may be readily renewed by the fish coming to the surface of the water and causing air to enter by way of the mouth and Eustachian tubes. (In some fish the air in the swim bladder is renewed in a similar way.) In the case of fish living below the surface,

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a different method of renewing the air has to be provided, namely, by forming a special connection with the gas-secreting gland (the swim bladder). This may be effected by either connecting the swim bladder with the middle ear by a tube or duct (Owen says this is the case in many osseous species of fish), or by making the swim bladder itself form the chamber, the change in volume of which (with change of depth below surface) brings about movements of the mechanism which connects with the internal ear. This is the arrangement found in carp, loach, and sleat-fish. About these fish Weber wrote (quoting the abstract given by Owen):

A canal is sent from the sac of each vestibule to a common sinus impar . . . which communicates on each side by a small orifice with two subspherical atria . . . which atria are supplied externally by the ossicles *l* and *m*, and by means of the large ossicle *o* are brought into communication with the forepart of the air-bladder *p*. Both the atria and common sinus are filled with endolymph. . . .

Weber actually named these three ossicles the malleus, incus, and stapes, and held that they existed chiefly in subserviency to the organ of hearing.

Muller concluded that the air-bladder in fishes, in addition to other uses, serves the purpose of increasing by resonance the intensity of the sonorous undulations communicated from water to the body of the fish. This conclusion is not accepted by Bridge and Haddon, who examined the anatomy of the swim bladder in many groups of fish. They state that the ossicles connecting the labyrinth with the swim bladder are less adapted to the conduction of fine sound vibrations than they are to the indications of gross changes in the capacity of the air-bladder, such as would be brought about, either rapidly by external changes in the hydrostatic pressure, or slowly by alteration in the volume of gas in that organ by secretion or reabsorption. They advance the following points against Weber's theory that the mechanism has an auditory function: (1) Sound vibrations would be passed from water to the air in the swim bladder with great loss of intensity. (2) In many Siluridæ, the walls of the air-bladder are very thick, and are therefore ill-adapted for conducting sound. (3) The ossicles have considerable inertia, have no useful lever action, and are not firmly connected (as they are in the ears of mammalia), so that they can vibrate rapidly under the action of sound waves as one concrete mechanism. (4) There is no evidence that the Siluridæ, which possess this mechanism, have exceptional powers of hearing.

None of the above objections apply to the alternative view that the mechanism is used for measuring air-bladder volume under changes of hydrostatic pressure. It would seem clear, therefore, at all events so far as this type of mechanism is concerned, that the perception of

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depth and corresponding control of direction is the function performed, and not that of audition.

The intermediate type of mechanism described early in this paper, in which the water exerts its pressure directly on an externally placed tympanum (as it does in the naval torpedo), now comes up for examination. It is at once found that so far as the anatomy and mechanical features of the apparatus are concerned, the function performed could be either that of audition or that of depth perception. And it would seem that both functions could be efficiently performed without modification. If any differentiation were possible, one would say that those fish in which the mechanism appears to be well designed (so far as freedom from friction, inertia losses, and back-lash are concerned) are more likely to employ the organ for audition than for depth perception, but this is probably a purely artificial criterion. It is probable, then, that in this type we see the direct connecting link between the depth-perceiving mechanism used by fish, and the apparatus for audition found in mammalia.

## SUMMARY.

The view is advanced that the auditory apparatus of mammalia which is represented by the cochlea, fenestræ, ossicles and tympanum, once formed in their ancestors an apparatus for perceiving not sound vibrations, but the depth below sea-level. If this view be correct it would explain why the cochlea, the semicircular canals and the otolith organs are associated together anatomically and have a common nerve, since if the cochlea perceives depth below surface, all three would be directly concerned with the perception of position and the control of direction.

## ABSTRACTS

### EAR.

*Changes in the Mastoid Process in Cases of Acute and Chronic Otitis Media as shown by the X-rays.* L. REVERCHON and G. WORMS.  
(*L'Oto-Rhino-Laryngologie Internationale*, April 1923.)

The authors find skiagraphy very helpful in cases of disease of the mastoid process and are surprised that the method is not more widely used. In general, the conditions found at operation are in agreement with what is shown in the skiagram. Pictures are taken of either side in the oblique lateral position—the rays entering as nearly as possible parallel to the meatus—and a third plate showing both sides of the head. The former show the parts in the relation in which they are approached surgically, while the latter has the advantage of showing both mastoid regions for comparison on the same plate. In acute otitis, even if mild in degree, changes are invariable in the skiagram of the mastoid region even during the first few days. This, as seen on the skiagram of the base, takes the form of a slight blurring of the outline of the cells on the affected side. It is an indication of tumefaction of the lining membrane, and, if resolution takes place, persists for a considerable period. If suppuration occurs, opaque areas are noticed with a gradual disappearance of the normal cellular outline. In cases of cholesteatoma, the cavity is seen surrounded by a dense shadow of eburnated bone. The compact mastoid throws a uniformly dense and structureless shadow of sharp outline. The situation of the antrum cannot usually be determined, but the lateral sinus is more easily located in these cases than in the normal, owing to the relatively greater disproportion in density. The compact type of mastoid should be regarded as pathological for the following reasons: skiagrams of the normal adult mastoid show a greater or less degree of cellular development in all, and this is invariably symmetrical in the absence of disease. The compact type is much more frequently found in cases submitted to operation than in the examination of anatomical specimens. In a skiagraphic examination of 30 cases of chronic suppuration without clinical evidence of mastoid complication, the mastoid process was uniformly dense and acellular. In addition, the density in cases of unilateral disease is found to be confined to the side of the lesion, or, in bilateral cases, is more marked on the side in which the disease has been more prolonged. In cases in which infection has dated from infancy, the mastoid process on the affected side is found not only to be sclerosed but also to be smaller in outline than the healthy side. These observations demonstrate that sclerosis is the result of infection.

A. J. WRIGHT.

*Primary Suture of the Wound in the Operation for Acute Suppuration of the Middle Ear.* GEORG KARL MÜLLER, Erlangen. (*Archiv. für Ohren-, Nasen-, und Kehlkopfheilkunde*, Bd. cxi., heft 1, 1923.)

Subjective sensations of throbbing, synchronous with the pulse, associated with obscuration of the parts of the malleus by inflammatory swelling of the drum, which fail to subside within fourteen days of the onset of acute suppuration of the middle ear, are generally, in Müller's experience, due to retention of pus in a peripheral mastoid cell. Less commonly, the empyema lies in the root of the zygoma, in a tube cell, or in the petrous portion, when stereoscopic radiograms are a valuable aid to diagnosis. The retention of pus may be relative or absolute.

Müller opens the empyema, but refrains as far as possible from interference with the antrum or mastoid cells as a whole. He closes the wound by primary suture. He disregards any slight swelling or tenderness of the wound in the absence of fever or graver symptoms.

His statistics show as low a mortality as those quoted from other sources. The advantages of the method are reduction of the healing period from five or eight weeks to two or three weeks, avoidance of bony necrosis leading to fistula, set up by the pressure of tamponades, and lastly, better cosmetic results. Primary suture is contra-indicated in the presence of intracranial complications, Bezold's mastoiditis, extensive subperiosteal abscesses, and certain difficulties in connection with the operation wound. It is less applicable in children in whom an empyema is commonly situated in the antrum.

Müller considers that the method of primary suture ranks among the most noteworthy advances in mastoid surgery since the introduction of Schwartze's antrotomy.

WM. OLIVER LODGE.

*Drainage of Cerebellar Abscess.* EAGLETON M. WELLS.  
(*Revue de Laryngologie*, 30th November 1922.)

Abscess of the cerebellum of otitic origin may be divided into (1) those situated anteriorly, in front of the lateral sinus, and (2) those situated immediately below and behind the sinus. The first class is roughly twice as numerous as the second. The cases occur secondarily to infection traversing the petrous bone. The second class follows phlebitis of the sinus.

The writer discusses the route of approach to abscesses situated anteriorly. He considers that incision of the dura in front of the sinus gives insufficient room for exploration, and is dangerous on account of the proximity to the great lymph spaces at the base of the brain. Even if exploration is negative, there is great risk of fatal meningitis as the result of opening the meninges through an infected area.

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More room may be obtained by chiselling away the posterior labyrinth, but this is an unnecessary mutilation in cases where the labyrinth is not infected. Double ligatures and division of the sinus, as practised by Bourquet, give more room, but the technique is difficult and the procedure somewhat risky, especially if the sinus is a large one.

Wells advocates free exposure of the sinus, by ample removal of bone and incision of the dura behind and parallel to the sinus. The sinus is then displaced forwards and obliterated by pressure. The writer states that a good exposure of the lateral lobe of the cerebellum is thus obtained, and the brain is approached through a comparatively non-infected area.

G. WILKINSON.

*Vertigo in Neurotics.* Dr R. LEIDLER and Dr P. LOEWY. (*Monats. für Ohrenh. und Laryngo-Rhinologie*, Year 57, Vols. i. to v.)

This long report represents a very thorough examination of 78 cases of neurosis, including neurasthenia, hysteria, migraine, and various other allied conditions. The article is divided into two main portions—the otological by Leidler, and the results of the neurological investigations by Loewy.

It does not lend itself to abstracting. Certain points of interest, however, are perhaps of clinical importance, and will serve to indicate the careful way in which the investigation was conducted.

Spontaneous nystagmus was present in all but 14 of the 78 cases, although it varied much in duration, intensity, and direction. Much variability also was found as regards the nystagmus in response to the vestibular tests.

On examination of the static sense, 22 showed a constant positive "Romberg," whilst in 21 this phenomenon was absent, and in the remaining cases results were variable.

Abnormal response was also found in the falling reaction after the vestibular tests, and the by-pointing results proved extraordinarily irregular, except that apparently a very definite tendency in one direction prevailed, irreconcilable with the stimulus induced.

In a group of cases such as this, various incidental middle ear and cochlear lesions were of course found. Their exact condition was carefully noted and taken into consideration.

The neurological part includes a most exhaustive examination of all the various symptoms and psychical complaints associated with various neuroses, and ascends, as one would expect, to more highly specialised heights than otologists can follow.

The authors conclude with the following replies to some of the questions which they had set themselves to answer at the commencement of their undertaking.

# Nose and Accessory Sinuses

1. The subjective static phenomena in connection with neurotics show every possible variation in movement, although both intensity, quality, and direction may be accurately determinable for the individual. The objective appearances most often found are spontaneous nystagmus and by-pointing, together with falling and tumbling movements.

2. No outstanding difference between the phenomena as the result of organic disease and the condition in the neurotics exist. Quantitative variation in respect of frequency and intensity may be said to constitute a main point of differentiation.

3. Associated with the vertigo, headache and "vegetative" symptoms are prominent. This latter term the authors have coined as representing a condition of the neurotic's "giddy attacks," which they consider are not true vertigo. The "giddiness" comprises really, in their opinion, only a part or a phase of the primary subjective phenomena of the attacks.

To the remainder of their questions they find it difficult as yet to offer any satisfactory reply. They suggest that even the amount of research which they have undertaken, and the data gained, should only be regarded as a mere introduction to an investigation which should be still further pursued. The report will be valuable at any rate as a reference, and should certainly serve towards the further association of the neurologist and otologist, whose close collaboration in the diagnosis of these cases is rapidly becoming more and more imperative.

ALEX. R. TWEEDIE.

## NOSE AND ACCESSORY SINUSES.

*Specific Infection as the Cause of Ozaena.* BRUNO BUSSON. (*Munch. Med. Wochenschrift*, No. 14, Jahr. 70.)

The investigations carried out by Shiga and Busson at the State Sero-Therapeutic Institute in Vienna are a substantial reaffirmation of the assumption that this disease is due to the *cocco-bacillus foetidus ozaenae* first described by Perez.

The main argument against the assumption of Perez is based on the inability of subsequent investigators to discover the *cocco-bacillus* in all cases. The failure may be largely obviated by noting that the bacillus is more difficult to demonstrate in old-standing than in recent phases of the disease, and by examining, not the crusts which swarm with saphrophytes especially the *B. proteus*, but the secretion lying directly on the mucous membrane and beneath the crusts. The investigators were able to reaffirm all the distinct characteristics attributed by Perez to the *cocco-bacillus*. Such were, the production of the typical foetor in the artificial culture, the high pathogenesis in

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puppies and the concomitant affection of the nose in the animals experimented upon. The Perez bacillus secretes a poison which it imparts to the fluid culture medium, and this is then capable of producing changes analogous to those produced by the living organism.

JAMES B. HORGAN.

*An Operation for Atrophic Rhinitis (Ozæna).* JAMES ADAM,  
M.A., M.D. (*Brit. Med. Journ.*, 16th June 1923.)

This is another attempt to alleviate the condition by reducing the undue width of the nasal passages. The author had found the paraffin method beneficial at times, but unreliable, while Halle's dislocation of the naso-antral wall towards the middle line seemed to him rather a formidable operation. Under local anæsthesia and after efficient cleansing of the area, flakes of cartilage removed from a costal cartilage are introduced under the muco-perichondrium of the septum and of the antral wall, between the middle and inferior turbinates. The incisions are closed by careful packing with bismuth gauze which is left for four or five days. Only one side of the septum should be dealt with at a time to avoid necrosis, and the necessary amount of cartilage required for the second operation can be stored in a subcutaneous pocket.

T. RITCHIE RODGER.

*The Peptone Treatment of Spasmodic Rhinorrhœa.* GEORGE  
PORTMANN. (*Revue de Laryngologie*, November 1922.)

The writer's contention is that some cases of spasmodic coryza are due to albuminoid poisoning, and are therefore to be classed with urticaria, asthma, and hay fever as manifestations of anaphylaxis. The antianaphylactic treatment employed by him consists in the administration of beef peptone (0.25 gram.) in a cachet, a quarter of an hour before the midday and evening meal. He reports 4 cases cured out of 8 in which the treatment was tried. All the cases were very severe. The peptone treatment was first instituted by Valéry-Radot, Haguenan, and Watelet in 1921.

G. WILKINSON.

*Lesions of the Nasal Sinuses and Optic Nerves.* A. SARGNON.  
(*L'Oto-Rhino-Laryngologie Internationale*, May 1923.)

The author reports some cases of retro-bulbar neuritis in association with latent infection of the posterior ethmoidal cells or sphenoidal sinuses. Transillumination of the sphenoidal sinuses, by means of a small light placed against the floor and a telescopic tube against the anterior wall of the sinus, may be helpful. Skiagraphy is occasionally useful, and for this, frontal and parietal views should be taken. The cases are almost invariably unilateral, and retro-bulbar pain on movement of the eyes is frequent. The diagnosis of retro-



## Nose and Accessory Sinuses

bulbar neuritis due to a latent sinusitis is made by exclusion. In the absence of any other cause, and if the Wassermann is negative and antiseptic treatment unsuccessful, one should act on the assumption of a latent ethmoidal and sphenoidal infection. In some cases the condition progresses to loss of vision, but others recover spontaneously. It is, however, wrong to withhold treatment on the chance of recovery, provided such treatment does not involve undue risk to life. This is often more necessary in bilateral cases. The interference should be carried out as early as possible. In the absence of orbital or other severe complications, the intranasal route should be followed, preferably under local anæsthesia. Operation consists in removal of the middle turbinal and opening up of the posterior ethmoidal and sphenoidal sinuses. If thought advisable, this can be done in two stages. Removal of the middle turbinal alone is sometimes effective in producing improvement of the vision. This may be due to drainage, or possibly, in some cases, to the relief of congestion by hæmorrhage. Five cases are related in detail.

A. J. WRIGHT.

*A Critical Review of the Surgery of the Lachrymal Apparatus.* Dr A. BLUMENTHAL. (*Folia Oto-Laryngologica*, Vol. xxi., Nos. 6-8, p. 223.)

Disorders of the lachrymal apparatus are fully dealt with, and the merits of the West and Toti operations are discussed. On the whole, the endonasal operation is preferable, but it has, of course, its limitations. A large opening exposing the whole of the inner wall of the sac is recommended, and this wall should be entirely removed. The difficulties of localising the inner wall of the sac are pointed out, and the use of a probe passed into the sac pushing the inner wall medially is encouraged. Various modifications introduced by other workers are criticised.

General anæsthesia is recommended only in children. The endonasal operation has yielded good results in lupus and tuberculosis, but it is too early yet to dogmatise. The author concludes by emphasising the importance of a correct diagnosis and an accurate technique, so that by uniform results and few mishaps we may convince the ophthalmologist of the merits of the nasal operation.

ANDREW CAMPBELL.

*Sphenoidal Sinus Suppuration.* GUSTAV SPIESS. (*Münch. Med. Wochenschrift*, No. 2, Jahr. 70.)

The frequency with which this affection evades diagnosis may be surmised from the fact that, since the last influenza epidemic, post-mortem examination has revealed the sinus to be affected in an

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even larger percentage of cases than the maxillary antra. Radiography, though helpful, will often fail to assist in the diagnosis.

The writer in forming his diagnosis places more reliance on the following symptoms of the disease. The headache could be better described as an indefinable pressure than as a pain. It is localised in the temporal region or on the vertex, and is almost continuous, without exacerbations. The patients display a furtive, anxious appearance and are frequently the victims of severe psychic depression. They are incapable of mental concentration. They are easily tired mentally and physically, and often complain of sleeplessness.

Amongst eye symptoms may be mentioned asthenopia, conjunctivitis and constriction of the visual field.

The history of the onset of the affection, particularly if influenzal, is an important help.

Given such a history and the above symptoms the writer has no hesitation, even in the absence of any definite radiographic indications, in formulating the diagnosis of sphenoidal sinus suppuration with possible involvement of the posterior ethmoidal cells, and in instituting the appropriate operative treatment. The diagnosis has been almost invariably confirmed, not by the actual conditions seen at the operation but by the success attending the procedure.

JAMES B. HORGAN.

### LARYNX.

*Diagnosis and Treatment of Tuberculosis of the Larynx.* L. de REYNIER. (*Archives Internationales de Laryngologie-Otologie, etc.*, June 1923.)

The author is laryngologist to a large sanatorium in Switzerland, and his work is based on many thousands of cases. In his opinion the prognosis of tuberculous laryngitis, except in the case of children, is far less gloomy than is commonly supposed. He shows how the situation and appearance of the lesions affect the gravity of the outlook.

He states that the evolution of the lesions in tubercular laryngitis is independent of the progress of disease of the lungs. Many cases of tubercular laryngitis have been witnessed in cases where the patients have died of pulmonary lesions. But he has never seen a case of pulmonary tuberculosis recover in which the laryngeal disease has got progressively worse. After contrasting the effects of the various forms of treatment of these cases, he states that in his experience the galvano-cautery offers the very best hope of a cure. He proceeds to give in considerable detail the technique of this method. He concludes by quoting a number of cases so treated.

M. VLASTO.

# Larynx

*Amyloid Tumour Formations in the Larynx.* V. UCHERMANN and FRANCIS HARBITZ. (*Acta Oto-Laryngologica*, Vol. v. fasc. 2.)

A man, 69 years of age, complained of gradually increasing hoarseness, noticed for three years, which was found to be due to a tumour in the anterior part of the larynx below the epiglottis. It was pale red in colour, of the size of a haricot bean, and ulcerated over a small area behind. It was removed by the endolaryngeal route with the galvano-cautery.

In the course of a post-mortem examination on a man 60 years of age who died of general paralysis, the larynx was found to present several greyish yellow excrescences covered by intact mucous membrane on the vocal cords, the anterior surfaces of the arytenoids, the aryteno-epiglottic folds and the posterior surface of the epiglottis.

In both of these cases microscopic examination showed the tumours to consist of large irregular masses of amyloid material embedded in a connective tissue matrix.

Localised amyloid tumour formations are rare. Their presence in the air passages (including pharynx and base of tongue) has been recorded in 60 cases. They are found occasionally in all parts of the respiratory tract from the nose to the lungs; in the larynx they occur chiefly on the posterior surface of the epiglottis and the aryteno-epiglottic folds. Generalised amyloid degeneration is occasionally accompanied by somewhat similar tumour formations, but is absent in most cases of isolated amyloid tumours, the cause of which is at present quite unknown.

THOMAS GUTHRIE.

*Cyanosis during Operation, due to a Membranous Epiglottis.* W. M. WHARRY, F.R.C.S. (*Brit. Med. Journ.*, 25th August 1923.)

In this case, breathing became difficult during an operation for tonsillectomy, and artificial respiration did not lead to any improvement. The larynx was then examined with the finger, and it was found that the epiglottis was flaccid and entirely devoid of cartilage, suggesting the feel of soft wash-leather. It lay right over the larynx, in contact with the posterior wall of the pharynx, thus acting as a valve, permitting a little air to escape from the chest but none to enter.

The epiglottis was hooked forward with the finger and respiration was quickly re-established. The author thinks this condition may be the cause of some otherwise unexplained cases of respiratory difficulty under an anæsthetic.

T. RITCHIE RODGER.

*Tracheo-laryngostomy.* Professor GHERARDO FERRERI. (*Archivii Italiani di Laringologia*, Anno 43, Nos. 1, 2, 3, and 4, 1923.)

Professor Ferreri opens by claiming for Ruggi the credit of first performing the operation, though it was later elaborated by laryngologists

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of other countries. He defines tracheo-laryngostomy as a complete and continuous opening of the larynx and upper part of the trachea, which is preserved until the air-way has been dilated to the desired extent, when it can be closed by an autoplasmic operation which leaves the air passages lined with epithelium and of normal dimensions.

The operation is very useful in cases of stenosis following chondritis, perichondritis, suppuration round a foreign body, neoplasm and fistula into the cesophagus. It is not advisable in cases of paralysis, ankylosis or failure of development, or in patients suffering from tuberculosis or syphilis. Very small babies stand the procedures badly, and old people tend to contract broncho-pneumonia.

The operation is very useful for cases following wounds, fractures, and especially gun-shot wounds, but should not be attempted while there is any necrosis of cartilage. Ferreri always does the operation as a set operation, performing a tracheotomy in urgent cases. He lays great stress on the most meticulous sterilisation of skin and of the mouth and uses warm calcium hypochlorite solution.

Except in small children and very nervous patients he uses local anæsthesia, relying on Schleich solution first, and then a solution of cocaine and adrenalin applied under control of the laryngoscope, followed by injection through the cricothyroid membrane or tracheotomy wound. General anæsthesia, when used, is administered by a Kühn's tube. A long incision divides the soft parts from hyoid to sternum. The third and fourth rings of the trachea are incised and a cannula inserted. The thyroid cartilage is divided by cartilage shears and the two alæ are retracted. The cricoid and upper rings are then divided and the whole wound opened up. Any tumour or cicatrix is now dissected away, and, if necessary, part of the cricoid cartilage removed. The author then packs the cavity with compressed cotton-wool pledgets, wrapping in gauze and smearing with ointment. He condemns the use of rigid dilators at this stage. When the raw surfaces have epithelialised he takes a cast of the inside of the widened air-way in wax, and makes a silver or vulcanite dilator with a cannula at its lower end for the trachea. This accurately fits the walls of the larynx and the subcricoid space and keeps up a steady pressure. When it is considered that the larynx has reached a stationary condition the dilator is removed and the anterior incision is closed. The author does not suture the edges in the middle line, as a cicatrix in the line of the laryngostomy is unsound surgically, and leads to laryngocele. He turns over a rectangular flap of skin from the neck on to the opening, cutaneous side inwards, after destroying the hair follicles with X-rays or radium, and covers over the bare area with another flap of skin raised up from the sides of the wound.

F. C. ORMEROD.

## REVIEW OF BOOK

*Aromatics and the Soul: A Study of Smells.* By DAN M'KENZIE, M.D. Heinemann. 176 pp., Demy 8vo. Price 7s. 6d. net. 1923.

An exhaustive scientific treatise on the sense of smell characterised by "minute, punctilious, unwearying, laboured comprehensiveness, Teutonic in its over and under and through," as yet remains unwritten. However, the former editor of this *Journal* has provided us with a study of smells which is less stodgy and more assimilable. What he modestly refers to as "this light omelette of scientific literature" provides a mental pabulum of great value, not only on account of its ingredients, but equally because of the skill with which it is prepared and of the charm with which it is served to the reader.

The chapter headings: Olfaction and public health; the sense of olfaction in lower animals; olfactory memory; smell and speech; smell in folk-lore, religion, and history; the ultimate; smell and the personality; theories of olfaction; they are phials which conceal the fragrance of their contents. Only the title of the last chapter, "Dust of the Rose Petal," affords a clue to the particular charm pervading the book. Not the least factor contributing to this attraction is a leaven of humour, and one feels that science may be better served with a fragrant smile than with the musty, academic contraction of the corrugator.

Besides being *sauviter in modo*, the pages are decidedly *fortiter in re*, and contain a wealth of information and suggestion distilled from a vast literature, widely scattered in time and place, in addition to the author's own valuable observations, interpretations, and reflections. The book reveals many problems, and perhaps no more stimulating introduction to osmics, the science of smell, in all its aspects, could be presented to the student who wishes to explore a largely uncharted area of science, or to the general reader who, consciously or unconsciously, is interested in the experience gained by means of a sorely neglected sense. And because the sense of smell is generally neglected, the author makes a special plea for its conscious cultivation. "But little more is needed in this way than to pay attention to the olfactory sensations that reach us, for the very fact of taking note of them is sufficient, probably, to increase the power and delicacy of olfaction, this being always the effect of the mental process known as attention. Smell may thus be easily cultivated and improved, and with the increase in its appreciation of the world comes an enriching of the other sense impressions that is quite surprising."

## Review of Book

One of the many characteristics of this book which make it so satisfactory is that it does not satisfy. Redolent with facts, each chapter is a book in embryo, and perhaps the author may yet intend to be generous to the Oliver Twists among his readers. The sense of smell reveals the character of things, of persons, of places, the very essence in fact. The smells of Cologne, of Lucerne, of China, of London, of Edinburgh, are mentioned, and adumbrate a smell-geography; e.g., on the coconut oil and tiere flower smell of Tahiti, the fern trees of New Zealand, the Creole quarter of New Orleans, the redwoods and eucalyptus in Santa Cruz, California, and the cigars, wine shops, and dust of Santa Cruz de Teneriffe.

Then, again, individual and racial smells, and individual and racial predilections for odours! We have, it is true, Monin's work on the odours of the human body, and the author's fascinating chapter on smell and the personality, but the whole problem of moods and memories induced by odours still requires elaboration. "Our study of smells," says the author, "has brought us, to be sure, into a strange region of psychology, for it is possible that we have here one explanation of the mysteries of crowd psychology, of those unreasonable waves of passion that sometimes sweep through masses of people and lead to all manner of strange happenings, like crusades and holy wars; autos-da-fè; witch burnings, lynch murders; State prohibition; spiritualistic manifestations; and other miracles." The reviewer ventures to put forward the suggestion, for investigation, that certain "psychical" phenomena, such as the "aura" of an individual, living or dead, may be but the sum total of his individuality or metabolism, as expressed by the odour, which may induce in hypersensitive observers, such as spiritualists, visual synæsthesiæ, sometimes coloured, and hallucinations.

It is quite impossible in a short review to indicate even a tithe of the material contained in *Aromatics and the Soul*, or of the many lines of research indicated therein. There is the question of the undulatory theory of Heyninx, the classification of smells by Zwaardemaker or Henning, the question of what Monin calls *l'invasion de l'amour par le nez*, the diagnosis of disease by smell, the history of perfumery, to name but very few of the problems Dr M'Kenzie gives us furiously to think about.

The sense of smell and its disorders is not merely of interest to the rhinologist, or to the chemist, physicist, biologist, psychologist, to the general practitioner, to the perfumer, the food tester, the historian, but to the general reading public as well, and the author's happy study will leave them all his grateful debtors.

J. H. KENNETH.

# GENERAL NOTES

ROYAL SOCIETY OF MEDICINE,

1 Wimpole Street, London, W. 1.

*Section of Laryngology*—President, Mr H. J. Banks-Davis, M.B., F.R.C.P.—Hon. Secretaries, Mr J. F. O'Malley, F.R.C.S., and Mr E. D. D. Davis, F.R.C.S.

The next Meeting of the Section will be held on Friday, 7th December, at 4.45 P.M. Members who are desirous of showing patients or specimens should give notice of the same to the *Senior Hon. Secretary*, Mr J. F. O'Malley, 6 Upper Wimpole Street, London, W. 1.

*Section of Otology*—President, Mr Sydney Scott, M.S. Hon. Secretaries, Mr Archer Ryland, F.R.C.S.Ed., and Mr T. H. Just, F.R.C.S.

The next Meeting of the Section will be held on Saturday, 8th December, at 10 A.M. Members who are desirous of showing patients or specimens should give notice of the same to the *Senior Hon. Secretary*, Mr Archer Ryland, 50 Harley Street, London, W. 1.

On Friday, 7th December, at 8.30 P.M., the Sections of Anæsthetics, Laryngology, Otology, Odontology, Ophthalmology, and Surgery will discuss "The Comparative Value of Cocaine Substitutes."

During the Session 1923-24, the *Sections of Laryngology and Otology* will meet upon the following dates:—

Section of Laryngology, on Friday 1st February, 7th March, 4th April, and 2nd May (*Annual Meeting*).

Section of Otology, on Saturday morning following each of the above dates, with the exception of the date in April.

A Conjoint Summer Meeting of the two Sections will be held in London on Friday and Saturday, 27th and 28th June 1924.

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## TREATMENT OF TUBERCLE IN THE NOSE AND THROAT BY FINSSEN-LIGHT-BATHS.

Dr O. Strandberg of the Finsen Institute, Copenhagen, will deliver a Lecture on the above subject on Monday, 3rd December, at 5.30 P.M., at the Royal Society of Medicine, 1 Wimpole Street. The address will be illustrated on the epidiascope in order to show the arrangement of the lamps and the technique of the treatment.

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## ELECTRICAL APPARATUS FOR THE DEAF.

At the Institution of Electrical Engineers, Savoy Place, Victoria Embankment, London, W.C. 2, a Discussion upon "Electrical Apparatus for the Deaf" will be held on the evening of Monday, 3rd December, at 7 o'clock. The Discussion will be opened by Mr C. M. R. Balbi. The President and Council of the Institution will welcome the attendance of members of the medical profession who are interested in the subject.

# General Notes

## THE SCOTTISH SOCIETY OF OTOTOLOGY AND LARYNGOLOGY.

The Eighteenth Meeting of the Scottish Society of Otology and Laryngology will be held in the Royal Infirmary, Glasgow, on the afternoon of Saturday, 15th December, at 3 o'clock.

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## THE SEMON LECTURE.

On Thursday, 1st November, the Semon Lecture, University of London, was delivered by Dr A. Logan Turner in the Hall of the Royal Society of Medicine. The Chair was occupied by Mr Charles A. Parker, F.R.C.S.E., who introduced the Lecturer to a large audience. After the delivery of his address, which is published in the current number of the *Journal*, Dr Logan Turner was presented by the Chairman with the Semon Medal, and was accorded a hearty vote of thanks.

On the motion of Professor Urban Pritchard, seconded by Dr Jobson Horne, Mr Parker was cordially thanked for his services in the Chair.

In the evening, Sir St Clair Thomson, exercising his well-known hospitality, gave a reception to which he had invited the members of the Sections of Laryngology and Otology, the Vice-Chancellor of the University of London, the Presidents of the two Royal Colleges in London, the President of the Royal Society of Medicine, Professor Burger of Amsterdam, and other guests.

On the following day the Winter Session of the Sections of Laryngology and Otology was inaugurated under the new arrangement which brings the Sections together on consecutive days. If the large number of members who attended the Meetings on this occasion is to be taken as a forecast of the future, the success of the movement will be assured, and the interest taken in the scientific work of the Sections will be increased. The new Presidents, Mr H. J. Banks-Davis and Mr Sydney Scott entertained their respective Councils and other friends at the close of the Sectional Meetings.

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## ANNUAL DINNER OF THE CENTRAL LONDON THROAT AND EAR HOSPITAL.

The Annual Dinner of the Medical Staff of the Central London Throat and Ear Hospital was held in the Trocadéro Restaurant on Friday, 2nd November. Dr Dan M'Kenzie presided over a gathering numbering about sixty, which included Sir Arbuthnot Lane, Sir John Young, Prof. Burger, Amsterdam, and representative members of the specialty in London, the Provinces, Scotland, and Ireland. Most of the guests were old students of the Hospital. Noteworthy speeches were made by the gentlemen above named and by Sir St Clair Thomson, Dr Andrew Wylie, Dr William Hill, and Mr Richard Kershaw, the Secretary of the Hospital. The last received a special ovation, and many kind references were made to his untiring labours on behalf of the institution with which he has been connected for about forty-six years. In the course of the evening a Loving Cup, subscribed for by the active members of the staff, was presented to Mr James Atkinson on his retirement.



# General Notes

## THE NEW YORK LARYNGOLOGICAL SOCIETY.

We offer our congratulations to the New York Laryngological Society on attaining its fiftieth anniversary. Founded by Clinton Wagner, in 1873, twenty years before the foundation of its sister Society in London, it was the first Society to devote its attention to the study of this special branch of medicine and surgery.

After a short period of separate existence, it became a Section of the New York Academy of Medicine, and as such, it celebrated, on 15th November, this important anniversary. In connection with the event, an exhibition was organised representing the many contributions made to the science and progress of Laryngology in the city of New York.

\* \* \*

## A CHAIR OF OTOTOLOGY.

Through the munificence of Mr Geoffrey E. Duveen, the University of London will be enabled to found a Chair of Otology. For this purpose the donor has gifted a sum of £10,000. In addition to this, Mr Duveen intends to present £15,000 to University College Hospital for the purpose of providing a hospital for the treatment of Ear disease and for the education of the student and practitioner. These donations have been made by the donor in memory of his father, Mr Henry J. Duveen, one of the founders of the Art firm of Duveen Brothers.

Mr Geoffrey Duveen's gift was given originally with the object of removing the Royal Ear Hospital from its present site in Dean Street, Soho, where it has stood for more than a century. With the amalgamation of the Hospital with University College Hospital, it was obvious that the present site in Soho was unsuitable for the teaching of students who were attending the School. By aid of the funds thus provided, a new building, therefore, will be erected in the vicinity of University College.

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The Editors of the *Journal* desire to express their indebtedness to, and their cordial appreciation of the work of, Dr Douglas Guthrie and the staff of collaborators, in the voluntary assistance which they have given throughout the year, in abstracting the current medical literature bearing upon the specialty.

## LIST OF ABSTRACTORS.

Campbell, Andrew, Johannesburg.	Ormerod, F. C., London.
Cavenagh, J. B., London.	Rankin, Nicol M., London.
Cleminson, F. J., London.	Rodger, T. Ritchie, Hull.
Dickie, J. K. Milne, Ottawa.	Ryland, Archer, London.
Diggle, F. Holt, Manchester.	Tweedie, Alex. R., Nottingham.
Dundas-Grant, Sir James, London.	Vlasto, Michael, London.
Goldsmith, Perry G., Toronto.	Watson-Williams, E., Bristol.
Guthrie, Douglas, Edinburgh.	Wilkinson, G., Sheffield.
Guthrie, Thomas, Liverpool.	Woodman, E. M., Birmingham.
Horgan, James B., Cork.	Wright, A. J., Bristol.
Jones, J. Arnold, Manchester.	Yearsley, Macleod, London.
Lodge, W. Oliver, Halifax.	Young, Gavin, Glasgow.

## General Notes

The *Journal of Laryngology and Otology* exchanges with the following periodicals :—

Archives of Radiology,	Archives Internationales de Laryngologie, etc.
Bristol Medico-Chirurgical Journal.	Bulletin d'Oto-Rhino-Laryngologie.
British Medical Journal.	La Presse Médicale.
Glasgow Medical Journal.	L'Oto-Laryngologie Internationale.
The Lancet.	Revue de Laryngologie, d'Otologie, et de Rhinologie.
Medical Press and Circular.	Archiv. f. Ohren-, Nasen-, und Kehlkopfheilkunde.
Proceedings Royal Society of Medicine.	Internationales Zentralb. f. Ohrenheilkunde und Rhino-Laryngologie.
St Bartholomew's Hospital Journal.	Monatschrift f. Ohrenheilkunde.
The Medical Journal of Australia.	Münchener Med. Wochenschrift.
Annals of Otology, Rhinology, and Laryngology.	Zeitschrift für Hals-, Nasen-, und Ohrenheilkunde.
Journal of Ophthalmology, Otology, and Laryngology.	Zentralblatt für Hals-, Nasen-, und Ohrenheilkunde.
Journal of the American Medical Association.	Zeitschrift f. Laryngologie.
The Laryngoscope.	Archivii Italiani di Laringologia.
New York Medical Journal.	Archivio Italiano di Otologia.
Surgery, Gynæcology, and Obstetrics.	Acta Oto-Laryngologica.
Annales des Maladies de l'Oreille du Pharynx, du Nez et du Pharynx.	Wiener Klinische Wochenschrift.

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The Editors will be glad to receive from writers of papers published in Journals other than the above, a short "Author's Abstract" containing the main points in their communication.

\* \* \*

### BOOKS RECEIVED FOR REVIEW.

- Die Radikaloperation des Ohres, ohne Gehörgangsplastik bei chronischer Mittelohreiterung.* Von Professor Dr Robert Bárány, Upsala. Franz Deuticke: Leipzig und Wien, 1923.
- Nouvel Appareil Perfectionné, pour l'obtention de Stéréogrammes du Larynx, sur le vivant.* Par Docteur Garel. Henri Peter: 2 Place Bellecour, Lyon.
- Ear, Nose, and Throat Nursing.* By James Hardie Neil, D.S.O., Ear, Nose, and Throat Surgeon, Auckland Hospital, New Zealand.  
The book can be obtained from H. K. Lewis & Co., Ltd., 136 Gower Street, London, W.C. 1.
- Applied Pathology in Diseases of the Nose, Throat, and Ear.* By Joseph C. Beck, M.D., University of Illinois College of Medicine, with 268 original illustrations. Price 37s. 6d. London: Henry Kimpton, 1923.

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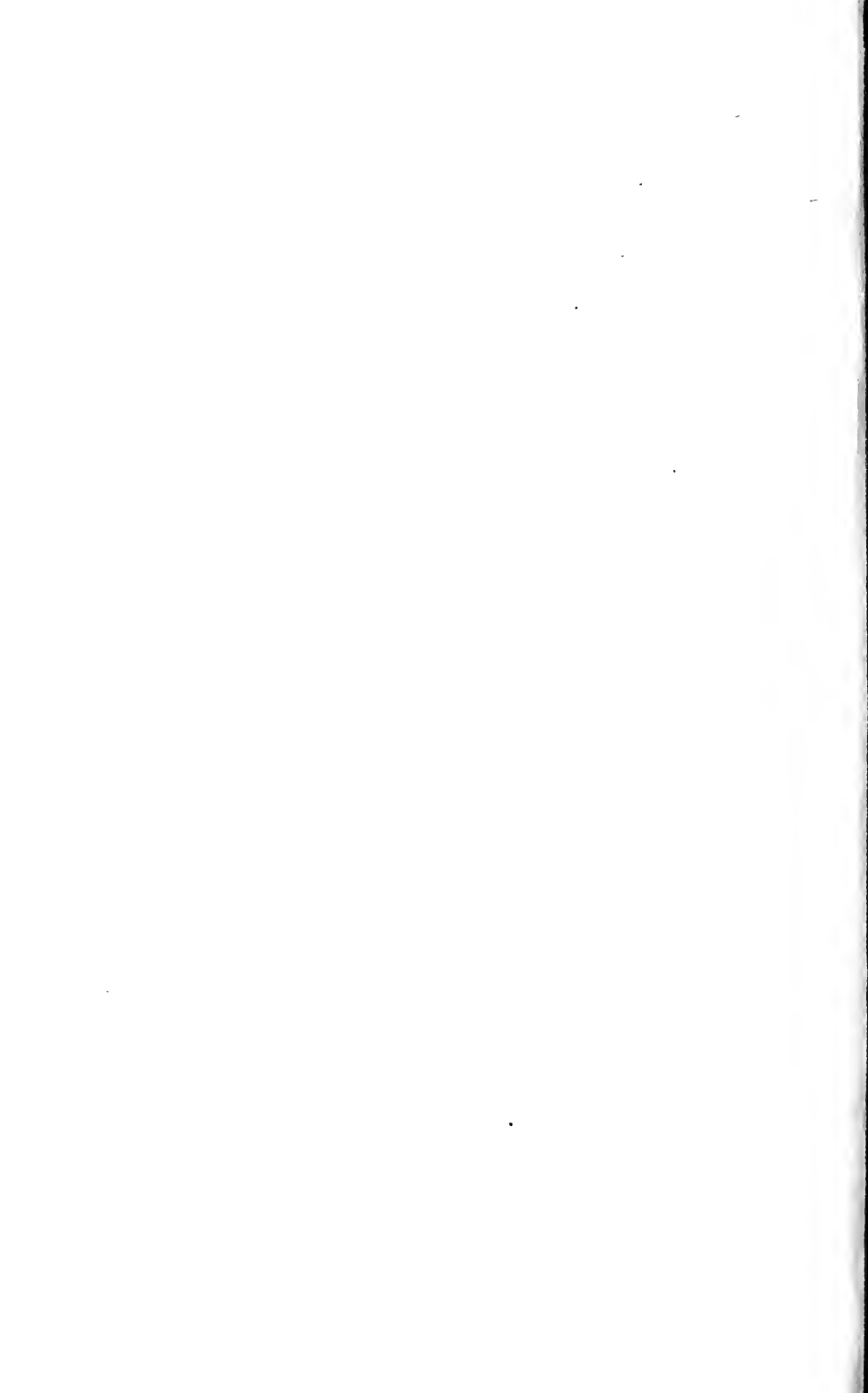
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